



TG/15/4(proj.2)
ORIGINAL: English
DATE: 2026-07-24

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

EUROPEAN PEAR *

UPOV Code(s): PYRUS_COM; PYRUS_BCO;
PYRUS_CUS

Pyrus communis L.;
Pyrus × *bretschneideri* Rehder ×
Pyrus communis L.;
Hybrids between *Pyrus communis* and
P. ussuriensis

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Germany

to be considered by the

*Technical Working Party for Fruit Crops at its fifty-seventh session,
to be held in Leipzig, Germany, from 2026-09-07 to 2026-09-10*

Disclaimer: this document does not represent UPOV policies or guidance

Alternative Names:*

Botanical name	English	French	German	Spanish
<i>Pyrus communis</i> L., <i>Pyrus asiae-mediae</i> (Popov) Maleev, <i>Pyrus</i> <i>balansae</i> Decne., <i>Pyrus bourgaeana</i> Decne., <i>Pyrus</i> <i>communis</i> L. subsp. <i>bourgaeana</i> (Decne.) Nyman, <i>Pyrus</i> <i>communis</i> L. var. <i>mariana</i> Willk., <i>Pyrus</i> <i>domestica</i> Medik., <i>Pyrus elata</i> Rubtzov, <i>Pyrus medvedevii</i> Rubtzov	European Pear, Pear	Poirier	Birne	Peral

* 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.]

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Pyrus</i> × <i>bretschneideri</i> Rehder × <i>Pyrus</i> <i>communis</i> L.				
Hybrids between <i>Pyrus</i> <i>communis</i> and <i>P.</i> <i>ussuriensis</i>				

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:

TG/169 (*Pyrus* rootstocks); and TG/149 (Japanese Pear)

It has been checked, and decided by the relevant LE for both European and Japanese Pear that the two TGs should be kept as separate ones. In this case it should be checked how hybrids would fit into the relevant drafts and where coherence between the drafts (e.g. characteristics and explanations) could be reached.

<u>TABLE OF CONTENTS</u>	PAGE
1. SUBJECT OF THESE TEST GUIDELINES	4
2. MATERIAL REQUIRED	4
3. METHOD OF EXAMINATION	4
3.1 NUMBER OF GROWING CYCLES.....	4
3.2 TESTING PLACE.....	4
3.3 CONDITIONS FOR CONDUCTING THE EXAMINATION	4
3.4 TEST DESIGN	5
3.5 ADDITIONAL TESTS	5
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	5
4.1 DISTINCTNESS.....	5
4.2 UNIFORMITY	6
4.3 STABILITY	6
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL	6
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS.....	7
6.1 CATEGORIES OF CHARACTERISTICS.....	7
6.2 STATES OF EXPRESSION AND CORRESPONDING NOTES.....	7
6.3 TYPES OF EXPRESSION	7
6.4 EXAMPLE VARIETIES	7
6.5 LEGEND	8
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTERES/MERKMALSTABELLE/TABLA DE CARACTERES.....	9
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	24
8.1 EXPLANATIONS COVERING SEVERAL CHARACTERISTICS.....	24
8.2 EXPLANATIONS FOR INDIVIDUAL CHARACTERISTICS.....	24
8.3 ADDITIONAL EXPLANATIONS ON THE TABLE OF CHARACTERISTIC	35
9. LITERATURE	38
10. TECHNICAL QUESTIONNAIRE	39

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Pyrus communis* L., *Pyrus* × *bretschneideri* Rehder × *Pyrus communis* L., and Hybrids between *Pyrus communis* and *P. ussuriensis* and its hybrids with other species of *Pyrus* L.

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 trees, on a rootstock specified by the competent authority, or in the form of budwood.

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

- (a) varieties resulting from crossing:
5 trees, budwood or shoots for grafting;
- (b) varieties resulting from mutation:
10 trees, budwood or shoots for grafting.

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

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

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

3.1.5 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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 The optimum stage of development for the assessment of each characteristic is indicated by a reference in the Table of Characteristics. The stages of development denoted by each reference are described in Chapter 8.

3.4 Test Design

3.4.1 In the case of varieties resulting from crossing, each test should be designed to result in a total of at least 5 trees.

3.4.2 In the case of varieties resulting from mutation, each test should be designed to result in a total of at least 10 trees.

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 or Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 3 plants or parts taken from each of 3 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the 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 These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 For the assessment of uniformity of varieties resulting from crossing, 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-types are allowed.

4.2.4 For the assessment of uniformity of varieties resulting from mutation a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 *Stability*

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

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Tree: growth habit (characteristic 2)
- (b) Young shoot: density of pubescence (characteristic 9)
- (c) Fruit: profile of sides (characteristic 35)
- (d) Fruit: hue of over color (characteristic 37)
- (e) Fruit: relative area of over color (characteristic 39)
- (f) Fruit: pattern of over color (characteristic 40)
- (g) Fruit: color of flesh (characteristic 55)
- (h) Time of beginning of flowering (characteristic 57)
- (i) Time of harvest maturity (characteristic 58)
- (j) Time of eating maturity (characteristic 59)

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 All relevant states of expression are presented in the characteristic.

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.

See chapter 8.4 for Synonyms of the example varieties

6.5 Legend

English				français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1	2	3	4	5	6	7			
		Name of characteristics in English		Nom du caractère en français		Name des Merkmals auf Deutsch	Nombre del carácter en español		
		states of expression		types d'expression		Ausprägungsstufen	tipos de expresión		

- | | | | |
|---|---|---|---------------------|
| 1 | Characteristic number | | |
| 2 | (*) | Asterisked characteristic | – see Chapter 6.1.2 |
| 3 | Type of expression | | |
| | QL | Qualitative characteristic | – see Chapter 6.3 |
| | QN | Quantitative characteristic | – see Chapter 6.3 |
| | PQ | Pseudo-qualitative characteristic | – see Chapter 6.3 |
| 4 | Method of observation (and type of plot, if applicable) | | |
| | MG, MS, VG, VS | | – see Chapter 4.1.5 |
| 5 | (+) | See Explanations on the Table of Characteristics in Chapter 8.2 | |
| 6 | (a)-(f) | See Explanations on the Table of Characteristics in Chapter 8.1 | |
| 7 | Growth stage key | See Explanations on the Table of Characteristics in Chapter 8.3 | |

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

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	(*)	QN	VG	(+)		00 or 39			
		Tree: vigor							
		very weak							1
		weak						Canal Red, Président Héron, Uta	2
		medium						Elektra, Lombacad, Williams' Bon Chrétien	3
		strong						Concorde, Red Druz	4
		very strong						Cape Rose ARC 1	5
2.	(*)	PQ	VG	(+)	(a)	00			
		Tree: growth habit							
		fastigate						Grand Champion	1
		upright						Dicolor, Jeanne d'Arc, Kristina	2
		semi-upright						Comtesse de Paris	3
		spreading						Coscia, Williams' Bon Chrétien	4
		drooping						Président Héron	5
		weeping						Dessertnaja, Packham's Triumph	6
3.	(*)	QN	MG/VG	(+)	(b)	00			
		One-year-old shoot: length of internode							
		very short							1
		short						Delsanne, Harrow Sweet, Oksana, Radana	2
		medium						Cape Rose ARC 1, Elektra, Verdi	3
		long						Beko, Hortensia, Rode Doyenne van Doorn	4
		very long							5
4.	(*)	PQ	VG		(b)	00			
		One-year-old shoot: predominant color on sunny side							
		grey green							1
		grey brown						Concorde, Oksana, Roksolana, Uta	2
		orange brown						Conference, Saels	3
		light brown						Condo, Santa Maria	4
		medium brown						Delwini, Petersbirne	5
		dark brown						Celina, Dicolor, Hortensia	6
		brown red							7
		brown purple						Lombacad, Radana, Thimo	8

		English		français		deutsch		español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	(*)	QN	MG/VG	(+)	(b)	00				
		One-year-old shoot: number of lenticels								
		very few								1
		few							Cape Rose ARC 1, Deldap, Holenicka	2
		medium							Conference, Louise Bonne d'Avranches	3
		many							Comtesse de Paris, Doyenné du Comice, Jeanne d'Arc	4
		very many							Roksolana	5
6.	(*)	QN	VG	(+)	(b)	00				
		One-year-old shoot: position of vegetative bud in relation to shoot								
		adpressed							Delwimor, Hortensia	1
		slightly held out							Concorde, Delwini, Lombacad, Verdi	2
		markedly held out							Jaco, Roksolana, Uta	3
7.	(*)	PQ	VG	(+)	(b)	00				
		One-year-old shoot: shape of apex of vegetative bud								
		acute							Beko, Concorde, Louise Bonne d'Avranches	1
		obtuse							Précoce de Trévoux	2
		rounded							Dessertnaja, Diana, Highland, Packham's Triumph	3
8.	(*)	QN	VG	(+)		32-35				
		Young shoot: anthocyanin coloration of growing tip								
		absent or very weak							Beurré des Enfants Nantais	1
		weak							Concorde, Radana, Uta	2
		medium							Clara Frijs, Tristan	3
		strong							Armida, Canal Red, Holenicka, Red Druz	4
		very strong							Bay 6474, Lombacad	5
9.	(*)	QN	VG			32-35				
		Young shoot: density of pubescence								
		absent or very sparse							Red Druz	1
		sparse							Amfora, Concorde, Lombacad	2
		medium							Hortensia	3
		dense							Armida, Dicolor	4
		very dense							Comtesse de Paris, RNA 0801	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.	(*)	QN	VG	(+)	(c)	71-77			
		Leaf blade: attitude in relation to shoot							
		upwards						Dekora	1
		outwards						Isolda, Lombacad	2
		downwards						Concorde, Conference, Santa Maria	3
11.	(*)	QN	MG/VG	(+)	(c)	71-77			
		Leaf blade: length							
		very short							1
		very short to short							2
		short						Curé, Remele	3
		short to medium						Beurré des Enfants Nantais	4
		medium						Bohemica, Highland	5
		medium to long						Delwini, Red Druz, Uta	6
		long						Concorde, Hortensia, Jaco	7
		long to very long						Sierra	8
		very long							9
12.	(*)	QN	MG/VG	(+)	(c)	71-77			
		Leaf blade: width							
		very narrow							1
		very narrow to narrow							2
		narrow						Olivier de Serres	3
		narrow to medium						Harrow Delight, Harvest Queen	4
		medium						Dicolor, Uta	5
		medium to broad						Delsanne, Delwini, Jaco	6
		broad						Radana, Santa Maria, Verdi	7
		broad to very broad						Remele	8
		very broad							9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13.	(*)	QN	MG/VG	(+)	(c)	71-77			
	Leaf blade: ratio length/width								
	very low								1
	very low to low								2
	low							Curé	3
	low to medium							Bohemia, Clara Frijs	4
	medium							Isolda	5
	medium to high							Elektra	6
	high							Dicolor, Harrow Sweet, Jaco, Roksolana	7
	high to very high							Delwimor, Nouveau Poiteau	8
	very high								9
14.		PQ	VG	(+)	(c)	71-77			
	Leaf blade: shape of base								
	acute							Armida	1
	right-angled							Canal Red, Elektra, Isolda	2
	obtuse							Concorde, Condo, Dicolor	3
	truncate							Diana	4
	cordate							Remele	5
15.		PQ	VG	(+)	(c)	71-77			
	Leaf blade: shape of apex								
	acuminate								1
	acute							Canal Red, Sierra, Uta	2
	right-angled							Dicolor, Red Druz, Roksolana	3
	obtuse							Delwimor, Delwini, Dessertnaja	4
	rounded							Curé	5
16.	(*)	PQ	VG	(+)	(c)	71-77			
	Leaf blade: margin								
	entire							Harrow Delight, Red Druz	1
	crenate							Canal Red, Radana, Saels	2
	serrate							Condo, Packham's Triumph, Sierra	3

		English		français		deutsch		español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.		QN	VG		(c)	71-77				
		Leaf blade: depth of incisions of margin								
		very shallow							Celina, Dicolor, Elektra	1
		shallow							Hortensia, Lombacad, Radana	2
		medium							Madame Verté	3
		deep							Cheremshyna	4
		very deep								5
18.	(*)	QN	VG	(+)	(c)	71-77				
		Leaf blade: curva-ture of longitudinal axis								
		very weak							Grand Champion, Moonglow	1
		weak							Dicolor, Hortensia, Lombacad	2
		medium							Starkrimson	3
		strong							Beko	4
		very strong							Bohemica, David	5
19.	(*)	QN	MG/VG	(+)	(c)	71-77				
		Petiole: length								
		very short							Delwilsap	1
		short							Dekora, Elektra	2
		medium							Delsanne, Dicolor, Hortensia	3
		long							Celina, Delwimor, Radana	4
		very long							Cape Rose ARC 1, Kristina	5
20.	(*)	QL	VG		(c)	71-77				
		Petiole: presence of stipules								
		absent							Harrow Delight	1
		present							Celina, Conference, Dicolor	9
21.		QN	VG	(+)		71-77				
		Petiole: position of stipules								
		towards base of petiole							Moonglow, Red Druz, RNA 0801, Royal Forelle	1
		at middle							Lombacad, Starkrimson	2
		towards base of leaf blade							Conference, Kristina	3

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22.	PQ	VG	(+)					
	Flower bud: shape							
	ovate							1
	narrow elliptic							2
	medium elliptic							3
	circular							4
23.	QN	MG/VG		(d)	60-65			
	Flower: length of sepal							
	very short							1
	short						Grand Champion, Harrow Sweet	2
	medium						Celina, Clara Frijs, Uta	3
	long						Cape Rose ARC 1, Delwini, Red Druz	4
	very long						Abbé Fétel, Beko	5
24.	PQ	VG	(+)	(d)	60-65			
	Flower: attitude of sepals in relation to corolla							
	adpressed						Harvest Queen, Lombacad, Sierra	1
	spreading						Beko, Cape Rose ARC 1, Celina, Radana	2
	recurved						Dicolor, Harrow Sweet, Red Druz	3
25.	(*)	QN	VG	(+)	(d)	60-65		
	Flower: arrangement of petals							
	free						Red Druz, Roksolana	1
	intermediate						Concorde, Harrow Sweet, Lombacad, Radana	2
	overlapping						Celina, Dicolor, Elektra	3
26.		QN	VG	(+)	(d)	60-65		
	Flower: position of stigmas relative to anthers							
	below						Elektra, Lombacad	1
	same level						Beko, Conference, Kristina, Red Druz	2
	above						Cape Rose ARC 1, Celina, Dicolor, Radana	3

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.		QN	MG/VG		(d)	60-65			
		Flower: size of petal							
		very small							1
		small						Roksolana, Sierra	2
		medium						Bohemica, Delwini, Lombacad	3
		large						Dicolor, Elektra, Kristina, Radana	4
		very large						Cape Rose ARC 1, Hortensia	5
28.	(*)	PQ	VG	(+)	(d)	60-65			
		Flower: shape of petal							
		transverse elliptic							1
		circular						Beko, Elektra, Harrow Sweet	2
		elliptic							3
		oblong							4
		narrow ovate						Delwini, Roksolana	5
		broad ovate						Celina, Dicolor, Lombacad, Radana, Red Druz	6
29.	(*)	QN	MG		(e)	89			
		Fruit: weight							
		very low							1
		very low to low						Doyenné de Juillet, Petersbirne	2
		low						Coscia, Harrow Sweet	3
		low to medium						Louise Bonne d'Avranches, Madame Verté	4
		medium						Celina, Dicolor, Rafzas	5
		medium to high						Bohemia, Williams' Bon Chrétien	6
		high						Beko, Sierra	7
		high to very high						Oksana	8
		very high						Lombacad	9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	(*)	QN	MG/VG	(+)	(e)	89			
		Fruit: height							
		very short							1
		very short to short						Olivier de Serres	2
		short						Madame Favre	3
		short to medium						Louise Bonne d'Avranches	4
		medium						Coscia, Madame Verté	5
		medium to long						Jeanne d'Arc	6
		long						Packham's Triumph	7
		long to very long						Condo	8
		very long						Sierra	9
31.	(*)	QN	MG/VG	(+)	(e)	89			
		Fruit: diameter							
		very small							1
		very small to small							2
		small						Doyenné de Juillet	3
		small to medium						Colorée de Juillet, Louise Bonne d'Avranches	4
		medium						CH 201, Coscia, Red Druz	5
		medium to large						Celina, Elektra, Verdi	6
		large						Dicolor, Roksolana, Uta	7
		large to very large						Lombacad, Radana, Rode Doyenne van Doorn	8
		very large						Broncet	9
32.	(*)	QN	MG/VG		(e)	89			
		Fruit: ratio height/diameter							
		very low						Delwilsap	1
		very low to low						Olivier de Serres	2
		low						Delsanne, Doyenné de Juillet, Radana	3
		low to medium						Celina, Dicolor, Rode Doyenne van Doorn, Uta	4
		medium						Bay 6485, Lombacad	5
		medium to high						Cape Rose ARC 1, CH 201, Verdi	6
		high						Bohemica, Concorde	7
		high to very high						Elektra, Roksolana, Sierra	8
		very high							9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33.	(*)	QN	VG	(+)	(e)	89			
	Fruit: position of maximum diameter								
	in middle							Delwilsap, Rafzas, Rode Doyenne van Doorn	1
	slightly towards calyx							Celina, CH 201, Red Druz, Uta	2
	clearly towards calyx							Delwini, Jaco, Moonglow	3
34.		QN	VG	(+)	(e)	89			
	Fruit: symmetry								
	symmetric							Condo, Delfrap, Elektra	1
	slightly asymmetric							Concorde, Lombacad, Uta	2
	strongly asymmetric							Abbé Fétel, Thimo	3
35.	(*)	PQ	VG	(+)	(e)	89			
	Fruit: profile of sides								
	concave							Beko, Concorde, Uta	1
	straight							CH 201, Dicolor, Elektra	2
	convex							Bay 6485, Cape Rose ARC 1, Celina	3
36.	(*)	PQ	VG	(+)	(e)	89			
	Fruit: ground color of skin								
	not visible							Uta	1
	green							Delwini, Isolda	2
	yellow green							Concorde, Dicolor	3
	yellow							Abbé Fétel, Deldap, Rafzas	4
37.	(*)	PQ	VG	(+)	(e)	89			
	Fruit: hue of over color								
	orange							Concorde, Uta	1
	orange red							Bohemica, Elektra	2
	pink red							Cape Rose ARC 1	3
	red							CH 201, Dicolor	4
	purple							Celina, Lombacad, Radana, Rode Doyenne van Doorn	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38.	(*)	QN	VG		(e)	89			
		Fruit: intensity of over color							
		very light							1
		very light to light							2
		light							3
		light to medium							4
		medium							5
		medium to dark							6
		dark							7
		dark to very dark							8
		very dark							9
39.	(*)	QN	VG		(e)	89			
		Fruit: relative area of over color							
		absent or very small						Beko, Oksana, Uta	1
		very small to small						Concorde, Delwimor	2
		small						David	3
		small to medium						Isolda, Red Druz	4
		medium						CH 201	5
		medium to large						Elektra, Thimo	6
		large						Celina, Rode Doyenne van Doorn	7
		large to very large						Bay 6485, Dicolor, Royal Forelle	8
		very large						Canal Red, Reddie, Starkrimson	9
40.	(*)	PQ	VG		(e)	89			
		Fruit: pattern of over color							
		only solid flush							1
		solid flush with stripes							2
		only stripes							3
		flushed and mottled							4
41.	(*)	QN	VG	(+)	(e)	89			
		Fruit: relative area of russet around stalk attachment							
		absent or very small						Celina, Elektra, Red Druz	1
		small						Cape Rose ARC 1, Concorde	2
		medium						Reddie	3
		large						Bay 6485, Lombacad, Rode Doyenne van Doorn	4
		very large						Abbé Fétel, Delsanne, Uta	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42.		QN	VG	(+)	(e)	89			
	Fruit: relative area of russet on cheeks								
	absent or very small							Celina, Elektra, Radana	1
	small							Abbé Fétel, Bay 6485, Rode Doyenne van Doorn	2
	medium							Nouveau Poiteau	3
	large							Roksolana	4
	very large							Grand Champion, Uta	5
43.	(*)	QN	VG	(+)	(e)	89			
	Fruit: relative area of russet around eye basin								
	absent or very small							Cape Rose ARC 1, Celina, Dicolor, Elektra	1
	small							Amfora, Concorde, Verdi	2
	medium							Bay 6485, Lombacad	3
	large							Beko, Delsanne, Rode Doyenne van Doorn	4
	very large							Grand Champion, Oksana, Uta	5
44.	(*)	QN	MG/VG	(+)	(e)	89			
	Fruit: length of stalk								
	very short								1
	very short to short							Beurré d'Anjou	2
	short							Bay 6474	3
	short to medium							Bay 6485, Royal Forelle	4
	medium							Beko, Rode Doyenne van Doorn	5
	medium to long							Celina, Elektra, Lombacad, Uta	6
	long							Bohemia, Concorde, Dicolor	7
	long to very long							Bella di Giugno, Beurré Bosc	8
	very long							Delfrap, Radana	9
45.	(*)	QN	MG/VG		(e)	89			
	Fruit: thickness of stalk								
	very thin								1
	thin							Concorde, Dessertnaja, Diana, Harrow Sweet	2
	medium							Amfora, Dicolor, Red Druz, Uta	3
	thick							Delsanne, Delwimor, Elektra	4
	very thick							Lombacad, Rode Doyenne van Doorn, Starkrimson	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46.		QN	VG	(+)		89			
	Fruit: attitude of stalk in relation to axis of fruit								
	straight							Elektra, Lombacad, Uta	1
	slightly oblique							Concorde, Dicolor, Radana	2
	strongly oblique							Abbé Fétel, Grand Champion	3
47.		QN	VG	(+)	(e)	89			
	Fruit: curvature of stalk								
	absent or very weak							Delwimor, Delwini, Elektra, Verdi	1
	weak							Celina, Concorde, Lombacad, Uta	2
	medium							Delsanne, Radana	3
	strong							Bohemica	4
	very strong								5
48.	(*)	QN	MG/VG	(+)	(e)	89			
	Fruit: depth of stalk cavity								
	absent or very shallow							Abbé Fétel, Celina, Thimo	1
	shallow							Cape Rose ARC 1, Concorde, Dicolor	2
	medium							Elektra, Lombacad, Rode Doyenne van Doorn	3
	deep							Bay 6474, Delsanne	4
	very deep							Belle de Bruxelles	5
49.	(*)	QN	MG/VG	(+)	(f)	89			
	Fruit: depth of eye basin								
	very shallow								1
	shallow							Celina, Harrow Sweet, Radana	2
	medium							Concorde, Dicolor, Uta	3
	deep							Bay 6485, Delsanne, Roksolana	4
	very deep							Rode Doyenne van Doorn	5
50.	(*)	QN	MG/VG	(+)	(f)	89			
	Fruit: width of eye basin								
	very narrow								1
	narrow							Bohemica, Harrow Sweet, Red Druz	2
	medium							Cape Rose ARC 1, Concorde, Radana	3
	broad							Celina, Dicolor, Lombacad	4
	very broad							Rode Doyenne van Doorn	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
51.	(*)	PQ	VG		(f)	89			
		Fruit: surface of area around eye							
		even						Delwimor, Harrow Sweet	1
		slightly ribbed						Celina, Dicolor, Radana	2
		embossed						Rode Doyenne van Doorn	3
52.		PQ	VG	(+)	(f)	89			
		Fruit: arrangement of sepals							
		converging						Lombacad, Rode Doyenne van Doorn	1
		erect						Cape Rose ARC 1, Radana, Uta	2
		spreading						Celina, Dicolor	3
53.	(*)	QN	VG		(e)	89			
		Fruit: texture of flesh							
		very fine						HW 624	1
		fine						Delsanne, Dicolor, Elektra, Rode Doyenne van Doorn	2
		medium						Concorde, Roksolana, Uta	3
		coarse						CH 201, Radana	4
		very coarse							5
54.	(*)	QN	MG/VG	(+)	(e)	89			
		Fruit: firmness of flesh							
		very soft							1
		soft						Delsanne, Lombacad, Rode Doyenne van Doorn	2
		medium						Cape Rose ARC 1, Elektra, Uta	3
		firm						Concorde, Delwimor, Dicolor, Radana	4
		very firm						CH 201, Oksana	5
55.	(*)	PQ	VG		(e)	89			
		Fruit: color of flesh							
		white							1
		greenish							2
		yellowish							3
		pinkish							4
		reddish							5

		English		français		deutsch		español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
56.		QN	MG/VG		(e)	89				
		Fruit: juiciness of flesh								
		very dry								1
		dry							Bay 6474, Bay 6485, HW 624	2
		medium							Elektra, Lombacad	3
		juicy							Celina, Dicolor, Radana, Uta	4
		very juicy							Rode Doyenne van Doorn	5
57.	(*)	QN	MG/VG	(+)						
		Time of beginning of flowering								
		very early							Tema	1
		very early to early							Oksana	2
		early							Comtesse de Paris, Coscia, Rafzas	3
		early to medium							Roksolana	4
		medium							Bay 6474, Bay 6485, Cape Rose ARC 1, Uta	5
		medium to late							Delwini, Reddie	6
		late							Rode Doyenne van Doorn	7
		late to very late							Radana	8
		very late								9
58.	(*)	QN	MG/VG	(+)						
		Time of harvest maturity								
		extremely early								1
		extremely early to very early							Bella di Giugno, Delfrap, Doyenné de Juillet	2
		very early							Colorée de Juillet	3
		very early to early							Harrow Delight	4
		early							Harvest Queen, Radana	5
		early to medium							Celina, Rafzas, Reddie	6
		medium							Cape Rose ARC 1, HW 624	7
		medium to late							Harrow Sweet, Moonglow, Red Druz	8
		late							Beko, Conference, Lombacad	9
		late to very late							CH 201, Concorde, Dicolor	10
		very late							Bay 6474, Oksana, Roksolana, Uta	11
		very late to extremely late							Olivier de Serres	12
		extremely late								13

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
59.	(*)	QN	MG/VG	(+)					
		Time of eating maturity							
		extremely early							1
		extremely early to very early						Doyenné de Juillet	2
		very early						Bella di Giugno	3
		very early to early						Colorée de Juillet, Delfrap, Tristan	4
		early						Précoce de Trévoux, Radana, Starkrimson	5
		early to medium						Cape Rose ARC 1, Rafzas, Williams' Bon Chrétien	6
		medium						Delwini, Kristina, Moonglow, Red Druz	7
		medium to late						Concorde, Delwimor, Lombacad	8
		late						Bay 6485, Doyenné du Comice, Uta	9
		late to very late						Bohemica, Curé, Olivier de Serres	10
		very late						Cheremshyna	11
		very late to extremely late						Pervomajskaya	12
		extremely late							13

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

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

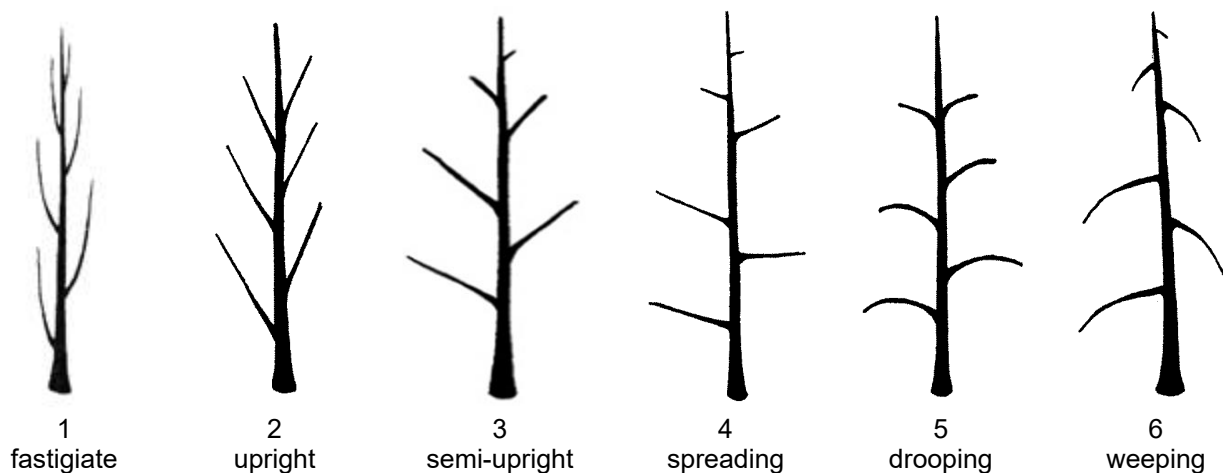
- (a) Observations should be made after at least one satisfactory crop of fruit.
- (b) Observations should be made in the middle third of lateral dormant shoots in winter, after at least one satisfactory crop of fruit.
- (c) Observations should be made on fully developed leaves from the middle third of vigorous vegetative current season shoots.
- (d) Observations should be made on second or subsequent flowers, at the start of anther dehiscence.
- (e) Observations should be made on fruits when they are eating ripe.
- (f) Observations should be made on fruits at harvest.

8.2 *Explanations for individual characteristics*

Ad. 1: Tree: vigor

The vigor of the tree should be considered as the overall abundance of vegetative growth, after at least one satisfactory crop of fruit. It can either be assessed at the peak of vegetative growth in summer (growth stage 39), or during the dormant season before pruning (stage 00), considering shoot length and thickness, and trunk diameter.

Ad. 2: Tree: growth habit



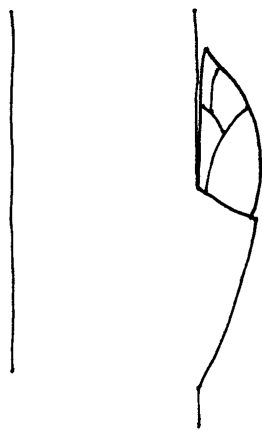
Ad. 3: One-year-old shoot: length of internode

Observations should be made using a vernier caliper gauge.

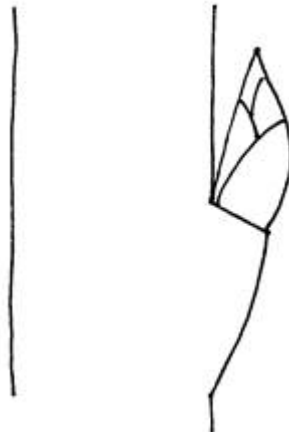
Ad. 5: One-year-old shoot: number of lenticels

Observations should be made by counting in a defined area [e.g. an area of 1 cm²] or by visual assessment of the density of lenticels on the bark.

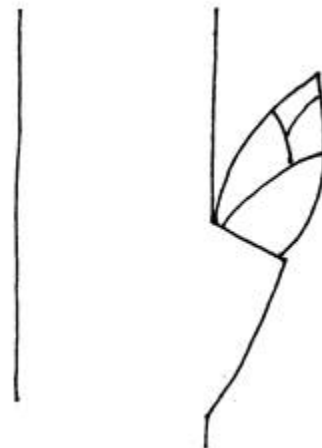
Ad. 6: One-year-old shoot: position of vegetative bud in relation to shoot



1
adpressed



2
slightly held out

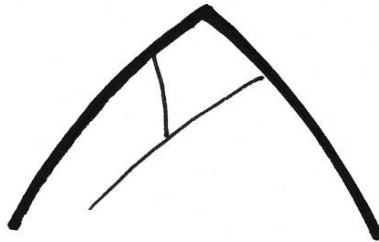


3
markedly held out

Ad. 7: One-year-old shoot: shape of apex of vegetative bud



1
acute



2
obtuse

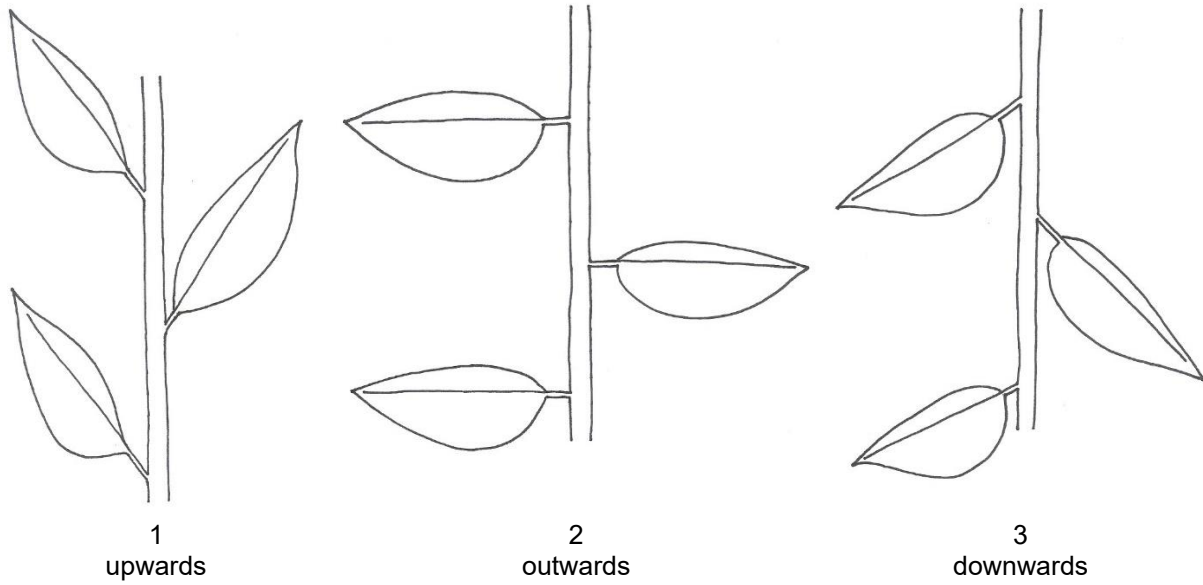


3
rounded

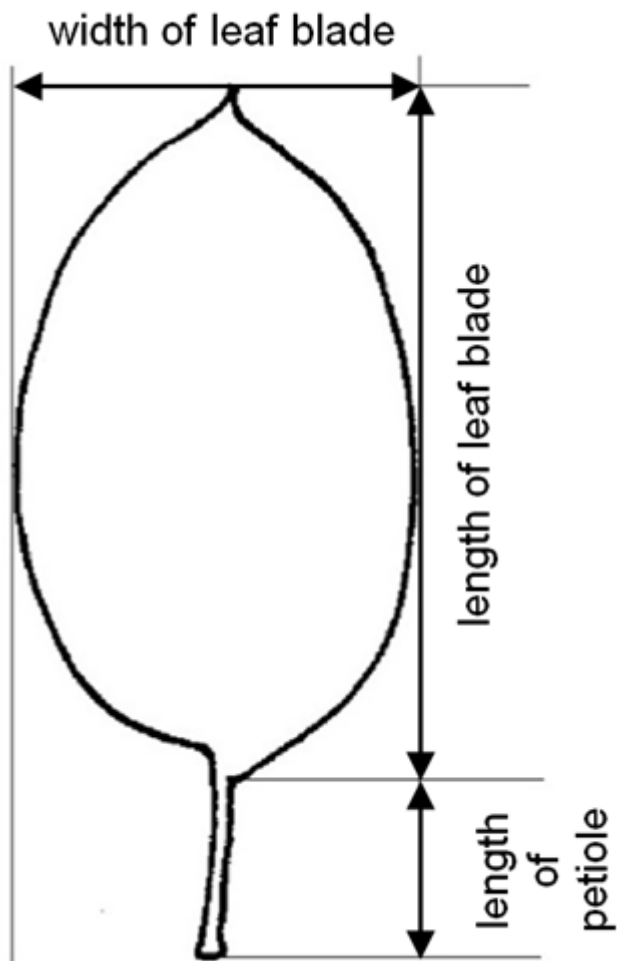
Ad. 8: Young shoot: anthocyanin coloration of growing tip

Observations should be made during rapid growth.

Ad. 10: Leaf blade: attitude in relation to shoot



Ad. 11: Leaf blade: length



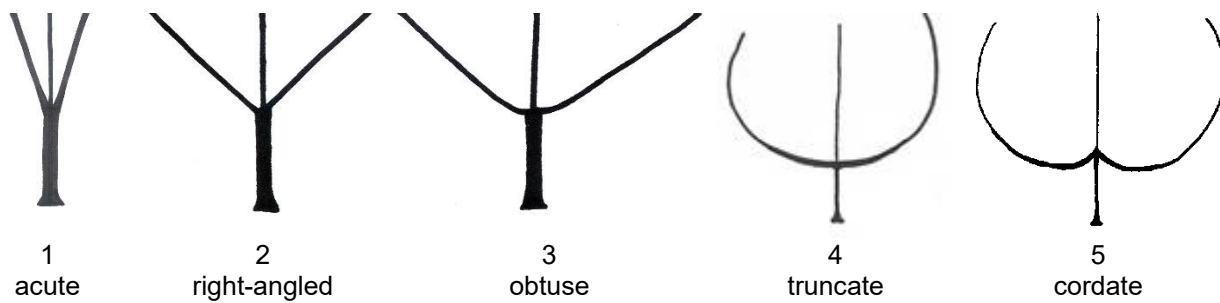
Ad. 12: Leaf blade: width

See Ad. 11

Ad. 13: Leaf blade: ratio length/width

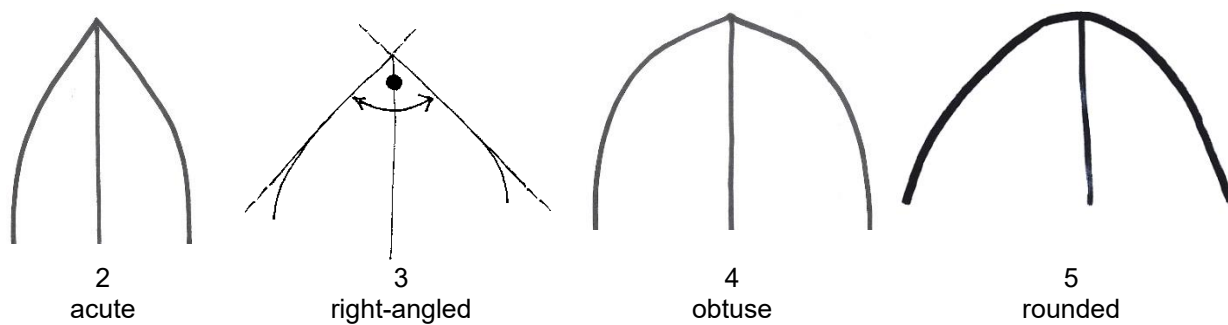
See Ad. 11

Ad. 14: Leaf blade: shape of base



Ad. 15: Leaf blade: shape of apex

Observations should be made excluding the pointed tip.



Ad. 16: Leaf blade: margin

The predominant type of incision at distal half should be observed.



1
entire

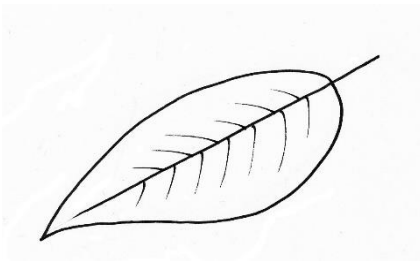


2
serrate

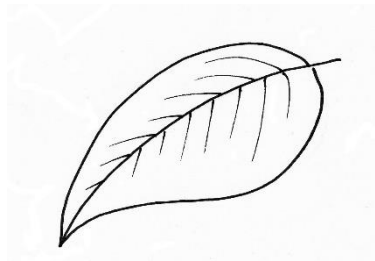


3
crenate

Ad. 18: Leaf blade: curvature of longitudinal axis



1
very weak



3
medium

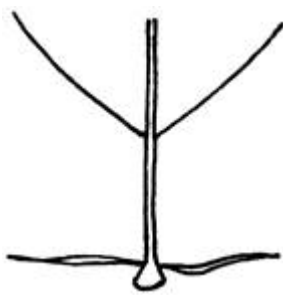


5
very strong

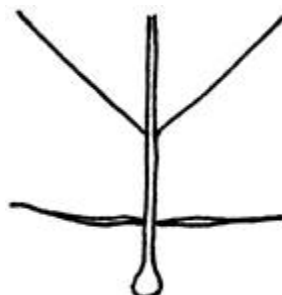
Ad. 19: Petiole: length

See Ad. 11

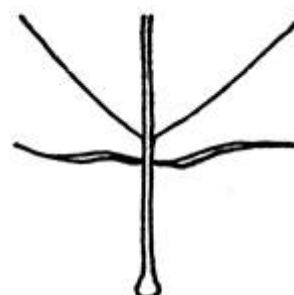
Ad. 21: Petiole: position of stipules



1
towards base of petiole



2
at middle

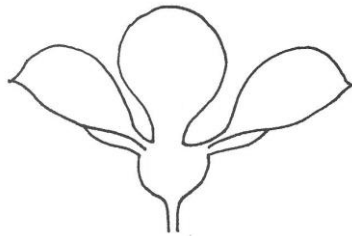


3
towards base of leaf blade

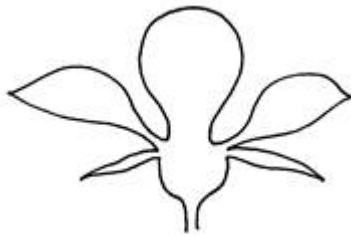
Ad. 22: Flower bud: shape

Observations should be made during dormancy, before bud swelling starts.

Ad. 24: Flower: attitude of sepals in relation to corolla



1
adpressed

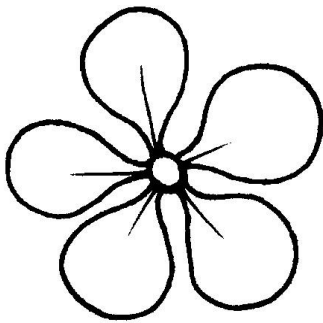


2
spreading

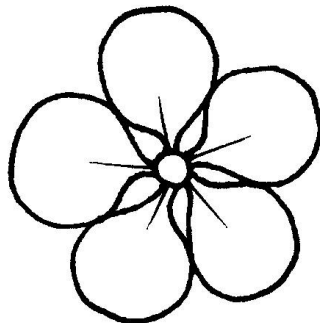


3
recurved

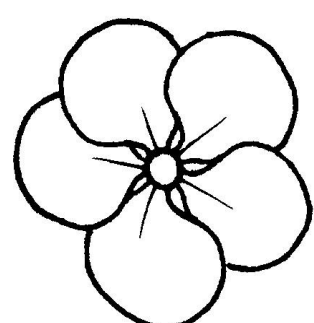
Ad. 25: Flower: arrangement of petals



1
free

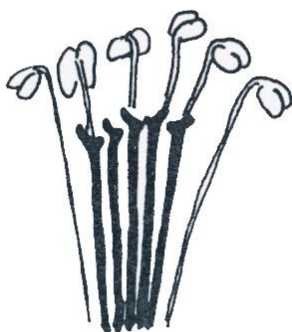


2
intermediate



3
overlapping

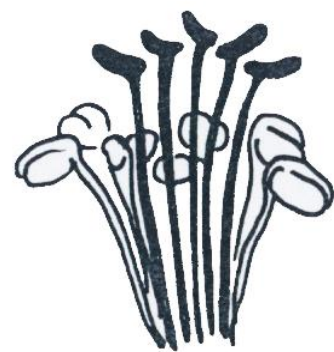
Ad. 26: Flower: position of stigmas relative to anthers



1
below



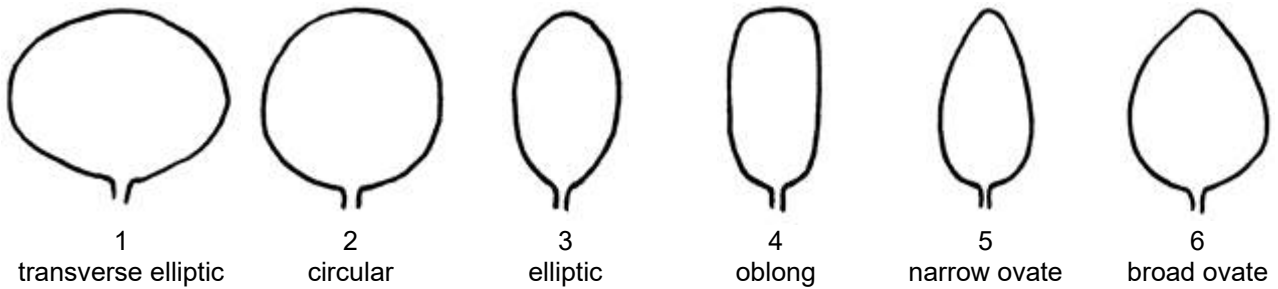
2
same level



3
above

Ad. 28: Flower: shape of petal

Observations should be made excluding the claw at the top of the petal.



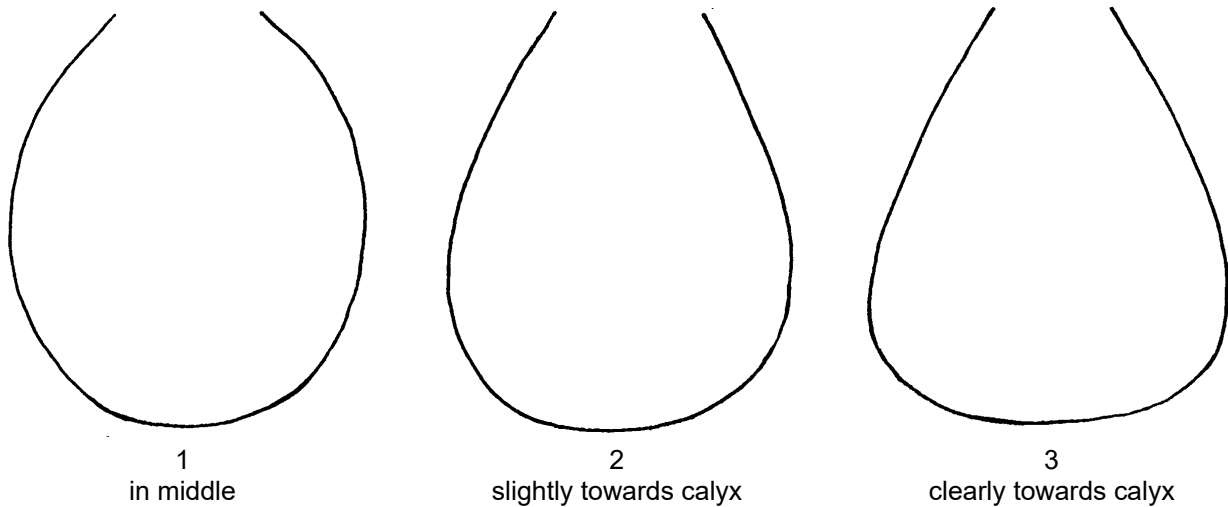
Ad. 30: Fruit: height

The maximum height should be observed, excluding the stalk.

Ad. 31: Fruit: diameter

The maximum diameter should be observed.

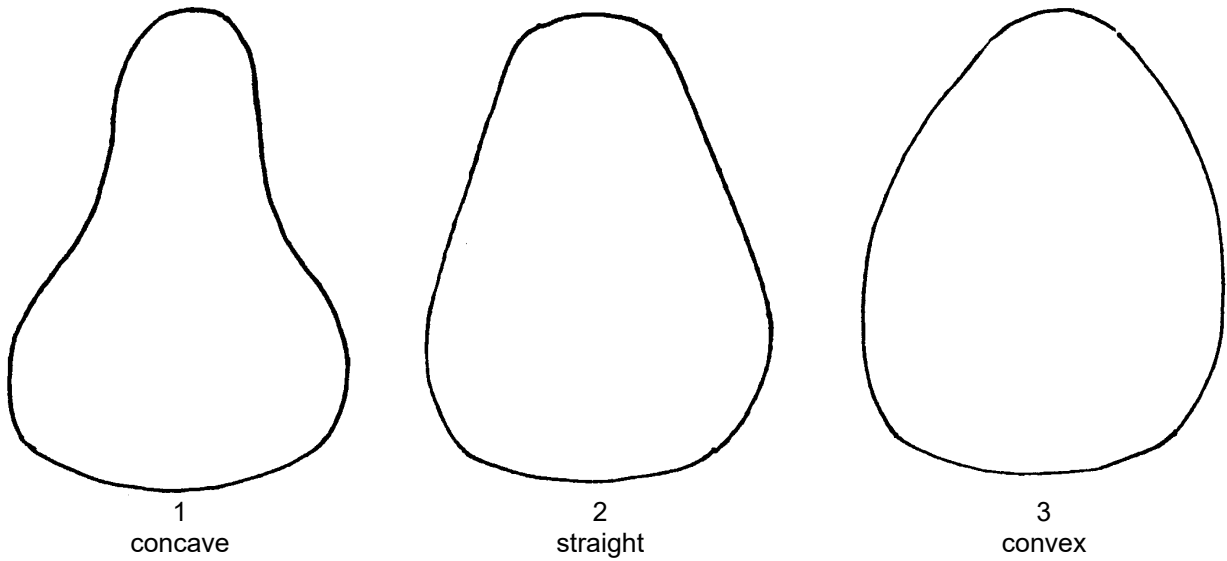
Ad. 33: Fruit: position of maximum diameter



Ad. 34: Fruit: symmetry

Observations should be made on fruits in longitudinal section.

Ad. 35: Fruit: profile of sides



Ad. 36: Fruit: ground color of skin

The ground color is the first color to appear chronologically during the development of the fruit.

Ad. 37: Fruit: hue of over color

Observations should be made after removing the bloom.

Ad. 41: Fruit: relative area of russet around stalk attachment

See Ad. 48.

The russet is a dull brown rough finish on the skin.

Ad. 42: Fruit: relative area of russet on cheeks

See Ad. 41 and Ad. 48.

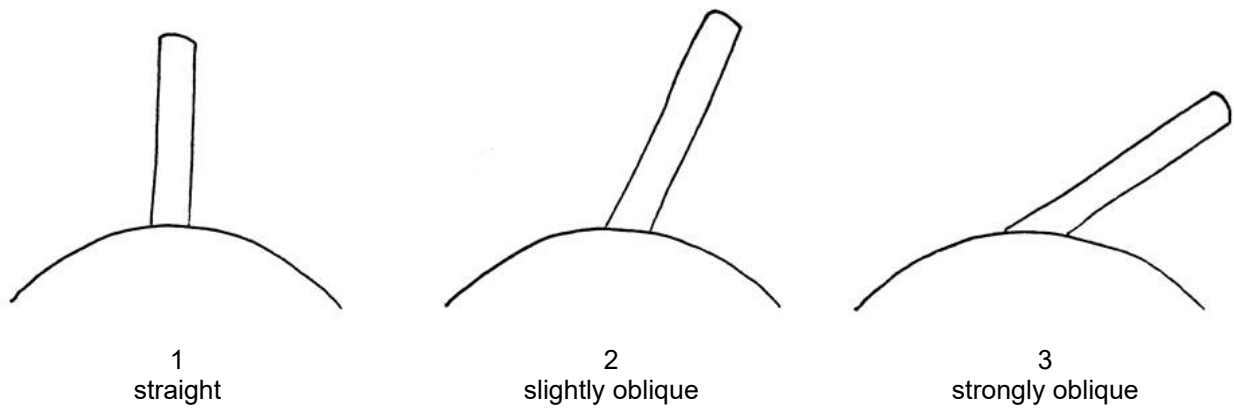
Ad. 43: Fruit: relative area of russet around eye basin

See Ad. 41 and Ad. 48.

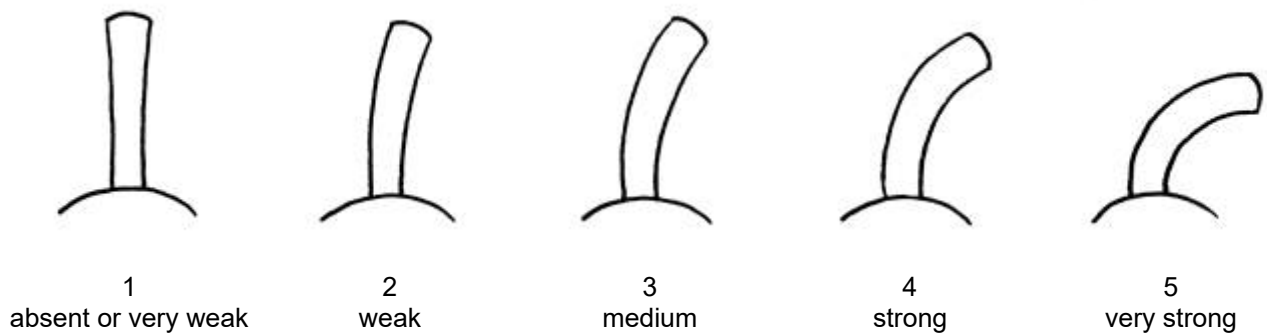
Ad. 44: Fruit: length of stalk

See Ad. 48

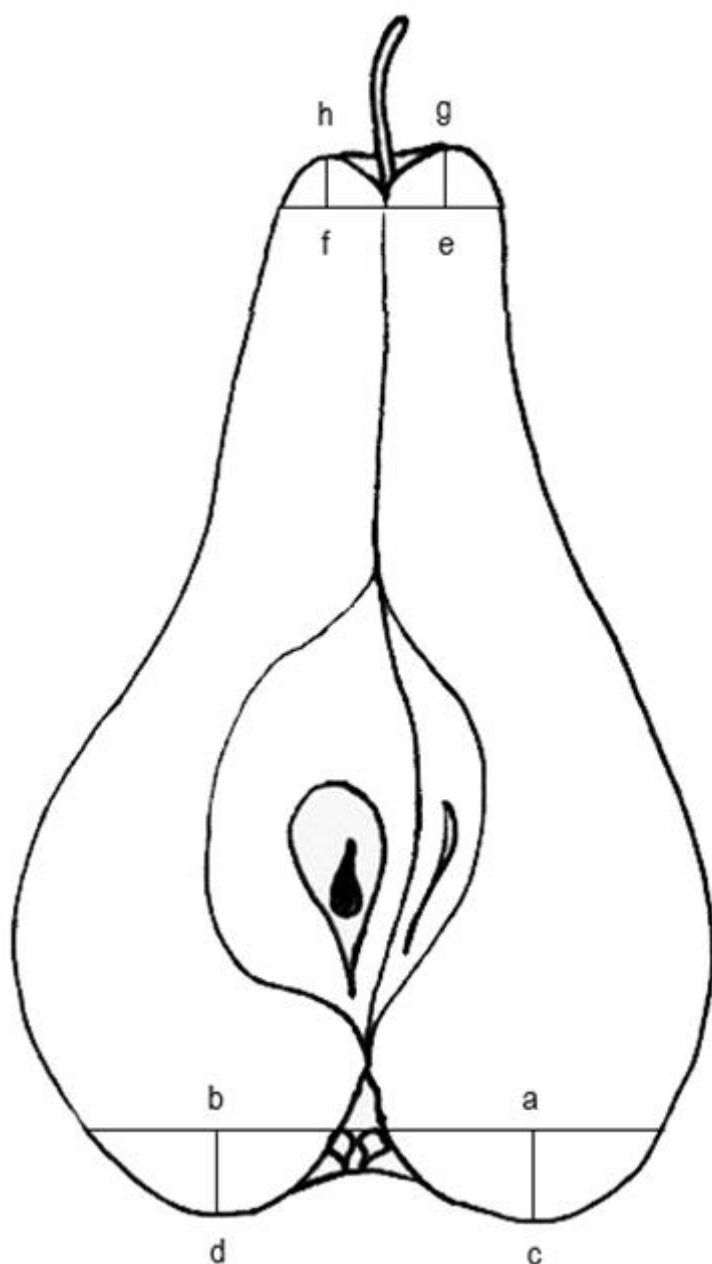
Ad. 46: Fruit: attitude of stalk in relation to axis of fruit



Ad. 47: Fruit: curvature of stalk



Ad. 48: Fruit: depth of stalk cavity



Fruits should be cut through the central axis as accurately as possible. Stalk cavity and eye basin depth and width should be measured from the sectioned fruits. The following diagram indicates the position of lines scored, using a knife or scalpel, on the fruit prior to measuring these characteristics.

- The lines a-b and e-f must be at right angles to the axis of the fruit. (A plastic protractor can be used to ensure accuracy.)
- The line a-b is marked at the base of the sepals.
- The line e-f is marked at the insertion of the stalk.
- The lines a-c and b-d indicate the eye basin depth. They are drawn at right angles to the line a-b to the point where the basin curve levels out.
- The lines e-g and f-h indicate the stalk cavity depth. They are drawn at right angles to the line e-f to the point where the stalk cavity curve levels out.
- In the case of asymmetric or irregular sections, observations should be made on the larger side (i.e. in case of depth of stalk cavity: e-g instead of f-h; in case of depth of eye basin: a-c instead of b-d).

f-h = depth of stalk cavity (characteristic 48)
a-c = depth of eye basin (characteristic 49)
a-b = width of eye basin (characteristic 50)

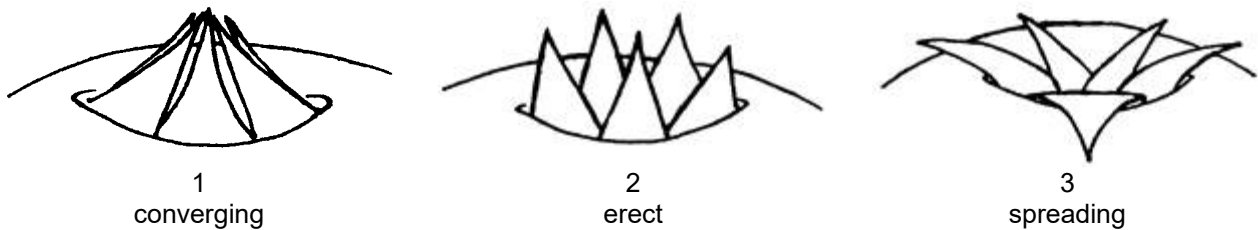
Ad. 49: Fruit: depth of eye basin

See Ad. 48

Ad. 50: Fruit: width of eye basin

See Ad. 48

Ad. 52: Fruit: arrangement of sepals



Ad. 54: Fruit: firmness of flesh

Observations can be made by measuring, using a penetrometer.

Ad. 57: Time of beginning of flowering

The time of flowering is reached when 10% of the flowers are fully open.

Ad. 58: Time of harvest maturity

The time for harvest is reached when fruits are ripe for picking and can most easily be picked from the trees. As this physiological stage of the fruit is characterized by a regression of starch content in the flesh, the time for harvest can also be determined by assessing the starch content.

Ad. 59: Time of eating maturity

The time of eating maturity is reached when the fruit is ripe for eating and has reached its optimum flavor and aroma. Eating maturity can be reached on trees or in cold chambers. As this physiological stage of the fruit is characterized by a further degradation of starch content in the flesh, the time of eating maturity can also be determined by assessing the starch content.

8.3 Additional Explanations on the Table of Characteristic

BBCH-Scale for the description of the phenological growth stages of pome fruit

Stage	Explanation
Principal growth stage 0: Bud development	
00	Dormancy: leaf buds and the thicker inflorescence buds closed and covered by dark brown scales
01	Beginning of bud swelling (leaf buds); buds visibly swollen, bud scales elongated, with light colored patches
03	End of leaf bud swelling: bud scales light colored with some parts densely covered by hairs
07	Beginning of bud break: first green leaf tips just visible
09	Green leaf tips about 5 mm above bud scales
Principal growth stage 1: Leaf development	
10	Green leaf tips 10 mm above the bud scales; first leaves separating (mouse-ear stage)
11	First leaves unfolded (others still unfolding)
15	More leaves unfolded, not yet at full size
19	First leaves fully expanded
Principal growth stage 2: (not applicable)	
Principal growth stage 3: Shoot development¹⁾	
¹⁾ From terminal buds	
31	Beginning of shoot growth: axes of developing shoots visible
32	Shoots about 20 % of final length
39	Shoots about 90 % of final length
Principal growth stage 4: (not applicable)	
Principal growth stage 5: Inflorescence emergence	
51	Inflorescence buds swelling: Inflorescence buds swelling: bud scales elongated, with light buds closed, light brown scales colored patches visible
52	End of bud swelling: light colored bud scales visible with parts densely covered by hairs
53	Bud burst: green leaf tips enclosing flowers visible
54	Mouse-ear stage: green leaf tips 10 mm above bud scales; first leaves separating Flower buds visible (still closed)
55	Flower buds visible (still closed)
56	Green bud stage: single flowers separating (still closed)
57	Red bud stage: flower petals elongating; sepals slightly open; petals just visible
59	Most flowers with petals forming a hollow ball
Principal growth stage 6: Flowering	
60	First flowers open
61	Beginning of flowering: about 10 % of flowers open
65	Full flowering: at least 50 % of flowers open, first petals falling
67	Flowers fading: majority of Flowers fading: majority of petals fallen
69	End of flowering: all petals fallen

Principal growth stage 7: Development of fruit	
71	Fruit size up to 10 mm; fruit fall after flowering
72	Fruit size up to 20 mm
73	Second fruit fall
74	Fruit diameter up to 40 mm; fruit erect (T-stage: underside of fruit and stalk forming a T)
75	Fruit about half final size
77	Fruit about 70 % of final size
Principal growth stage 8: Maturity of fruit and seed	
81	Beginning of ripening: lightening of cultivar-specific fruit color
85	Advanced ripening: increase in intensity of cultivar-specific color
87	Fruit ripe for picking
89	Fruit ripe for consumption: fruit have typical taste and firmness
Principal growth stage 9: Senescence, beginning of dormancy	
91	Shoot growth completed; terminal bud developed; foliage still fully green
92	Leaves begin to discolor
93	Beginning of leaf fall
97	All leaves fallen
99	Harvested product

(taken from: Biologische Bundesanstalt für Land- und Forstwirtschaft [1997])

8.4 Synonyms of example varieties

Example Variety	Synonym(s)
Abbé Fétel	Abate Fétel
Beurré Bosc	Alexanderbirne; Beurré d' Apremont; Boscs Flaschenbirne; Calebasse Bosc; Humbolds Butterbirne; Kaiserkrone
Beurré d'Anjou	Anjou; Birne von Anjou; Beurré Anjou; Nec Plus Meuris; Winter Meuris
Clara Frijs	Clara Fries
Colorée de Juillet	Bunte Julibirne; Gefärbte Julibirne; Julischönheit; Schönste Julibirne
Comtesse de Paris	Gräfin von Paris; Paris
Conference	Konference; Konferenzbirne
Coscia	Ercolini
Curé	Pastorenbirne; Popesti; Vicar of Winkfield
Dekora	Decora
Doyenné de Juillet	Julidechantsbirne; Poire de Juillet
Doyenné du Comice	Comice; Dechant; Dechantsbirne; Vereinsdechantsbirne
Elektra	HL 315023
Holenicka	Holenika; Holenická
Louise Bonne d'Avranches	Bonne Louise; Gute Luise; Gute Luise von Avranches; Louise Bonne; Louise Bonne de Jersey; Prinz von Württemberg; William IV.
Madame Verté	Besi de Caen; Beurre de Caen
Nouveau Poiteau	Neue Poiteau; Neue von Poiteau; Poiteau; Poiteaus Butterbirne
Olivier de Serres	Olivier von Serres
Packham's Triumph	Williams d'Automne
Pervomajskaya	Perwomaiskaja
Petersbirne	Große Petersbirne; Großvater-Birne; Lorenzbirne; Margaretenbirne; Rote Margarethenbirne; Weizenbirne
Précoce de Trévoux	Frühe aus Trevoux; Frühe von Trevoux; Trevoux
Président Héron	Präsident Heron
Remele	Junkersbirne; Münchner Wasserbirne; Remelesbirne; Remerle; Schwäbische Wasserbirne
Santa Maria	Marienbirne
Williams' Bon Chrétien	Bartlett; Stair's Pear; Williams Christ; Williams Christbirne

9. Literature

Arbury, J., 1997: "Pears." Wells & Winter, Mereworth, Maidstone, GB

Biologische Bundesanstalt für Land- und Fortswirtschaft (Editor), 1997: Growth Stages of Plants / Entwicklungsstadien von Pflanzen / Estadios de las Plantas / Stades de Développement des Plantes. BBCH-Monograph. Blackwell Wissenschaftsverlag Berlin, DE, Wien, AU

Bocek, O., 1954: "Pomologie." Statni Zemedelske Hakladatelstvi, Praha, CZ

Bordeianu, T., *et al.*, 1963: "Pomologia Republicii Socialiste Romania." Vol. 1-8, Editura Academiei Republicii Socialiste, Bucuresti, RO

Brozik, S., Regius, J., 1957: "Termesztett gyümölcsfajtáink. Almastermesuek, Körte es birs." Mezőgazdasági Kiado, Budapest, HU

Cifranic, P., *et al.*, 1978: "Pomologia." Priroda, Bratislava, CZ

Dahl, C.G., 1943: "Pomologia del II – Pärön och Plommon." Albert Bonniers Förlag, Stockholm, SE

Fleckinger, J., 1948: Les stades végétatives des arbres fruitiers, en rapport avec les traitements. Pomology Français 1948, supplements 81-93, FR

Hedrick, U.P., 1921: "The pears of New York – Report of the New York Experimental Station for the year 1921." J.B. Lyon Company, Albany, US

Kessler, H., 1948: "Birnsorten der Schweiz." Verlag Verbandsdruckerei AG, Bern, CH

Krümmel, H., Groh, W., Friedrich, G., 1964: "Deutsche Obstsorten." Bd. 1-3. Deutscher Landwirtschaftsverlag, Berlin, DE

Leroy, A., 1867: "Dictionnaire de pomologie I,II – Poires." Principales Librairies Agricoles et Horticoles, Angers, FR

Meier, U., 1997: Growth stages of mono- and dicotyledonous plants. Blackwell, Berlin, Vienna.

Morettini, A., Baldini, E., Scaramuzzi, F., Mittempergher L., 1967: "Monografia delle principali cultivar di pero." Consiglio nazionale delle ricerche, Centro Miglioramento Piante da Frutto, Firenze, IT

Morgan, J., 2015: "The Book of Pears". Penguin Random House, London, GB

Nicotra, A., Cobianchi, D., Faedi, W., Manzo, P., 1979: "Monografia di cultivar di pero." Ministero Agricoltura e Foreste, Roma, IT

Nilsson, A., 1989: "Våra päron-, plommon- och körsbärssorter." Karlebo Forlag AB, SE

Petzold, H., 1989: "Birnsorten." Verlag J. Neumann, Neudamm, Melsungen, Berlin, Basel, Wien, DE

Seitzer, J., Schüle, H., Wenck, F., 1957: "Farbtafeln der Birnsorten." Verlag Eugen Ulmer, Stuttgart, DE

Tomcsanyi, P., *et al.*, 1979: "Gyümölcsfajtáink, Gyakorlati pomologia." Mezőgazdasági Kiado, Budapest, HU

Van der Zwet, T., 1982: "The Pear." Horticultural Publishing, US

Votteler, W., 1993: "Verzeichnis der Apfel- und Birnsorten." Obst- und Gartenbauverlag, 3. Auflage, München, DE

Yamagata-ken, 1980: "The report on the characterization and classification of pear varieties." Yamagata Horticultural Experiment Station, JP

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 communis L.

☐

1.1.2 Common name

European Pear, Pear

1.2.1 Botanical name

Pyrus × bretschneideri Rehder × *Pyrus communis* L.

☐

1.2.2 Common name

1.3.1 Botanical name

Hybrids between *Pyrus communis* and *P. ussuriensis*

☐

1.3.2 Common name

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 varieties)

4.1.3 Discovery and development

(please state where and when discovered and how developed)

4.1.4 Other

(Please provide details)

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

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) *In vitro* propagation []

(b) Other (state method) []

4.2.2 Other []
(Please provide details)

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
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 (2)	Tree: growth habit		
	fastigate	Grand Champion	1 []
	upright	Dicolor, Jeanne d'Arc, Kristina	2 []
	semi-upright	Comtesse de Paris	3 []
	spreading	Coscia, Williams' Bon Chrétien	4 []
	drooping	Président Héron	5 []
	weeping	Dessertnaja, Packham's Triumph	6 []
5.2 (9)	Young shoot: density of pubescence		
	absent or very sparse	Red Druz	1 []
	sparse	Amfora, Concorde, Lombacad	2 []
	medium	Hortensia	3 []
	dense	Armida, Dicolor	4 []
	very dense	Comtesse de Paris, RNA 0801	5 []
5.3 (20)	Petiole: presence of stipules		
	absent	Harrow Delight	1 []
	present	Celina, Conference, Dicolor	9 []
5.4 (29)	Fruit: weight		
	very low		1 []
	very low to low	Doyenné de Juillet, Petersbirne	2 []
	low	Coscia, Harrow Sweet	3 []
	low to medium	Louise Bonne d'Avranches, Madame Verté	4 []
	medium	Celina, Dicolor, Rafzas	5 []
	medium to high	Bohemia, Williams' Bon Chrétien	6 []
	high	Beko, Sierra	7 []
	high to very high	Oksana	8 []
	very high	Lombacad	9 []
5.5 (33)	Fruit: position of maximum diameter		
	in middle	Delwilsap, Rafzas, Rode Doyenne van Doorn	1 []
	slightly towards calyx	Celina, CH 201, Red Druz, Uta	2 []
	clearly towards calyx	Delwini, Jaco, Moonglow	3 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics		Example Varieties	Note
5.6 (35)	Fruit: profile of sides		
	concave	Beko, Concorde, Uta	1 []
	straight	CH 201, Dicolor, Elektra	2 []
	convex	Bay 6485, Cape Rose ARC 1, Celina	3 []
5.7 (36)	Fruit: ground color of skin		
	not visible	Uta	1 []
	green	Delwini, Isolda	2 []
	yellow green	Concorde, Dicolor	3 []
	yellow	Abbé Fétel, Deldap, Rafzas	4 []
5.8 (37)	Fruit: hue of over color		
	orange	Concorde, Uta	1 []
	orange red	Bohemica, Elektra	2 []
	pink red	Cape Rose ARC 1	3 []
	red	CH 201, Dicolor	4 []
	purple	Celina, Lombacad, Radana, Rode Doyenne van Doorn	5 []
5.9 (39)	Fruit: relative area of over color		
	absent or very small	Beko, Oksana, Uta	1 []
	very small to small	Concorde, Delwimor	2 []
	small	David	3 []
	small to medium	Isolda, Red Druz	4 []
	medium	CH 201	5 []
	medium to large	Elektra, Thimo	6 []
	large	Celina, Rode Doyenne van Doorn	7 []
	large to very large	Bay 6485, Dicolor, Royal Forelle	8 []
	very large	Canal Red, Reddie, Starkrimson	9 []
5.10 (40)	Fruit: pattern of over color		
	only solid flush		1 []
	solid flush with stripes		2 []
	only stripes		3 []
	flushed and mottled		4 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties		Note
5.11 (55)	Fruit: color of flesh		
	white		1 []
	greenish		2 []
	yellowish		3 []
	pinkish		4 []
	reddish		5 []
5.12 (57)	Time of beginning of flowering		
	very early	Tema	1 []
	very early to early	Oksana	2 []
	early	Comtesse de Paris, Coscia, Rafzas	3 []
	early to medium	Roksolana	4 []
	medium	Bay 6474, Bay 6485, Cape Rose ARC 1, Uta	5 []
	medium to late	Delwini, Reddie	6 []
	late	Rode Doyenne van Doorn	7 []
	late to very late	Radana	8 []
	very late		9 []
5.13 (58)	Time of harvest maturity		
	extremely early		1 []
	extremely early to very early	Bella di Giugno, Delfrap, Doyenné de Juillet	2 []
	very early	Colorée de Juillet	3 []
	very early to early	Harrow Delight	4 []
	early	Harvest Queen, Radana	5 []
	early to medium	Celina, Rafzas, Reddie	6 []
	medium	Cape Rose ARC 1, HW 624	7 []
	medium to late	Harrow Sweet, Moonglow, Red Druz	8 []
	late	Beko, Conference, Lombacad	9 []
	late to very late	CH 201, Concorde, Dicolor	10 []
	very late	Bay 6474, Oksana, Roksolana, Uta	11 []
	very late to extremely late	Olivier de Serres	12 []
	extremely late		13 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics		Example Varieties	Note
5.14	Time of eating maturity		
(59)			
	extremely early		1 []
	extremely early to very early	Doyenné de Juillet	2 []
	very early	Bella di Giugno	3 []
	very early to early	Colorée de Juillet, Delfrap, Tristan	4 []
	early	Précoce de Trévoux, Radana, Starkrimson	5 []
	early to medium	Cape Rose ARC 1, Rafzas, Williams' Bon Chrétien	6 []
	medium	Delwini, Kristina, Moonglow, Red Druz	7 []
	medium to late	Concorde, Delwimor, Lombacad	8 []
	late	Bay 6485, Doyenné du Comice, Uta	9 []
	late to very late	Bohemica, Curé, Olivier de Serres	10 []
	very late	Cheremshyna	11 []
	very late to extremely late	Pervomajskaya	12 []
	extremely late		13 []

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

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
<i>Example</i>			

--

--

--

Comments

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

#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

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.

- Resistance to pests and diseases

- Virus status

(a) The variety is free from all known virus as follows (indicate from which viruses) ☐

.....

(b) The plant material is virus tested (indicate against which virus) ☐

.....

(c) The virus status is unknown ☐

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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

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.

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".

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]