E

TG/PYRUS(proj.2)
ORIGINAL: English
DATE: 2016-09-30

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

PEAR HYBRIDS

UPOV Code(s): PYRUS_BRE; PYRUS_LEC; PYRUS_USS

Pyrus ussuriensis Maxim.;
Pyrus xbretschneideri Rehder;
Pyrus ×*lecontei* Rehder

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from New Zealand
to be considered by the
Technical Working Party for Fruit Crops
at its forty-seventh session, to be held in Angers, France,
from 2016-11-14 to 2016-11-18

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
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

Pyrus x *bretschneideri* Rehder, *Pyrus* x *lecontei* Rehder

TABLE OF CONTENTS PAGE

1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Pyrus ussuriensis* Maxim., *Pyrus* xbretschneideri Rehde and *Pyrus* ×*lecontei* Rehder and hybrids between species and crosses with *P. communis* or *P. pyrifolia*.

1.2 *Pyrus* x *bretschneideri* Rehder, *Pyrus* x *lecontei* Rehder
(Delete Pyrus pyrifolia x from botanical name. Includes the three Pyrus 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/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 a single growing cycle.

3.1.2 The single growing cycle for evaluation cannot begin until trees have produced at least one crop of fruit.

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 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 Trees must produce at least two satisfactory crops of fruit during the test period, with the evaluation being carried out in a single growing cycle after 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 or 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 of plants 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 of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, 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 2)
(b) Fruit: size (characteristic 39)
(c) Fruit: position of maximum diameter (characteristic 44)
(d) Fruit: profile of sides (characteristic 46)
(e) Fruit: area of over color (characteristic 48)
(f) Fruit: hue of over color (characteristic 49)
(g) Fruit: presence of eye in calyx basin (characteristic 63)
(h) Time of beginning of flowering (characteristic 74)
(i) Time of harvest maturity (characteristic 75)

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

	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)

7 Not applicable

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: vigour					
		weak	faible	gering	débil	PremP45	3
		medium	moyenne	mittel	mediano	PremP109	5
		strong	forte	stark	fuerte	PremP36	7
2.	**(*)**	**PQ** **VG**	**(+)** **(a)**				
		Tree: growth habit					
		fastigiate					1
		upright				PremP109	2
		semi upright				PremP45	3
		spreading				PremP36	4
		drooping					5
		weeping					6
3.		**QN** **MS/VG**	**(a)**				
		One-year-old shoot: length of internode					
		very short	très courts	sehr kurz	muy cortos		1
		short	courts	kurz	cortos	PremP109	3
		medium	moyens	mittel	medios	PremP36	5
		long	longs	lang	largos		7
4.		**QN** **VG**	**(a)**				
		One-year-old shoot: thickness					
		thin	fin	dünn	delgada		1
		medium	moyen	mittel	mediana	PremP109	2
		thick	épais	dick	gruesa		3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.		**PQ VG**	**(a)**				
		One year old shoot: color on sunnyside					
		grey green					1
		grey brown					2
		greenish brown				PremP109	3
		orange brown				PremP36	4
		medium brown					5
		dark brown					6
		brown red					7
		brown purple				PremP45	8
		dark purple					9
6.		**QN VG**	**(a)**				
		One-year-old shoot: number of lenticels					
		few					1
		medium				PremP36	3
		many				PremP109	5
7.	**(*)**	**QN VG**	**(a)**				
		One year old shoot: size of lenticels					
		small				PremP109	3
		medium					5
		large					7
8.		**PQ VG**	**(a)**				
		One year old shoot: shape of vegetative bud apex					
		acute					1
		obtuse					2
		rounded				PremP36	3
9.		**QN VG**					
		One year old shoot: number of axillary flower buds					
		absent or few					1
		medium					3
		many				PremP109	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.		**QN VG**					
		Vegetative bud: position in relation to shoot					
		adpressed					1
		slightly held out				PremP109	2
		strongly held out				PremP36	3
11.		**QN VG**					
		Young shoot: density of pubescence					
		absent or very weak					1
		weak					3
		medium				PremP45	5
		strong				PremP109	7
12.	**(*)**	**QN MS/VG**					
		Leaf blade: length					
		short	court	kurz	corta		3
		medium	moyen	mittel	media	PremP45	5
		long	long	lang	larga		7
13.	**(*)**	**QN MS/VG**					
		Leaf blade: width					
		narrow	étroit	schmal	estrecha		3
		medium	moyen	mittel	media	PremP36	5
		broad	large	breit	ancha		7
14.	**(*)**	**QN MG/VG**	**(+)**				
		Leaf blade: ratio length/width					
		small	faible	klein	pequeña	PremP45	3
		medium	moyen	mittel	media	PremP36	5
		large	élevé	groß	grande		7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	**(*)**	**PQ VG**	**(+)**				
		Leaf blade: shape					
		ovate					1
		elliptic					2
		rounded					3
		obovate					4
		cordate					5
16.	**(*)**	**PQ VG**	**(+)**				
		Leaf blade: shape of apex					
		acuminate	acuminé	zugespitzt	acuminada		1
		acute	pointu	spitz	aguda		2
		obtuse					3
		rounded					4
17.	**(*)**	**PQ VG**	**(+)**				
		Leaf blade: shape of base					
		acute					1
		obtuse					2
		truncate					3
		cordate					4
18.		**QN VG**					
		Leaf blade: length of tip					
		absent or very short					1
		short				PremP45	3
		medium	moyenne	mittel	media		5
		long	longue	lang	larga	PremP36	7
19.		**PQ VG**	**(+)**				
		Leaf blade: incisions of margin (upper half)					
		entire					1
		crenate				PremP109	2
		serrate				PremP36	3
		dentate					4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.		**QN** **VG**					
		Leaf blade: depth of incisions of margin					
		absent or very shallow					1
		shallow					2
		medium				PremP36	3
		deep					4
21.		**QN** **MS/VG**					
		Petiole: length					
		short	court	kurz	corta		3
		medium	moyen	mittel	media	PremP36	5
		long	long	lang	larga	PremP109	7
22.		**QN** **MG/VG**					
		Ratio length of petiole/ length of blade					
		low				PremP109	3
		medium					5
		high					7
23.		**QL** **VG**					
		Shoot: location of flower buds					
		mainly on spurs					1
		mainly on long shoots					2
24.	**(*)**	**QN** **MG/VG**					
		Inflorescence: number of flowers					
		few					3
		medium					5
		many				PremP109	7
25.	**(*)**	**QN** **VG**					
		Flower bud: size					
		small					3
		medium				PremP36	5
		large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.		**PQ** **VG**					
		Flower bud: shape					
		ovate					1
		narrow elliptic					2
		medium elliptic					3
		rounded					4
27.		**QN** **VG**					
		Sepal: attitude in relation to corolla					
		adpressed					1
		spreading				PremP45	2
		recurving				PremP36	3
28.		**QN** **VG**					
		Flower: number of petals					
		very few				PremP109	1
		few					2
		medium					3
		many					4
29.	**(*)**	**QN** **VG**					
		Flower: arrangement of petals					
		free				PremP109	1
		touching				PremP45	2
		overlapping				PremP36	3
30.	**(*)**	**QN** **VG**					
		Flower: number of stamens					
		few					1
		medium					2
		many				PremP109	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	**(*) QN VG**					
	Flower: position of stigma in relation to anthers					
	below					1
	same level				PremP36	2
	above				PremP45	3
32.	**QN VG**					
	Anthers: intensity of red coloration					
	light					3
	medium					5
	dark				PremP109	7
33.	**QN MS/VG**					
	Petal: length					
	short					1
	medium					3
	long					5
34.	**QN MS/VG**					
	Petal: width					
	narrow					1
	medium					3
	broad					5
35.	**PQ VG**					
	Petal: shape					
	narrow ovate					1
	broad ovate					2
	elliptic					3
	circular				PremP109	4
36.	**PQ VG**					
	Petal: shape of base (excluding claw)					
	cuneate					1
	rounded					2
	truncate					3
	cordate					4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
37.		**PQ VG**					
		Petal: color of inner side					
		white					1
		light pink					2
		medium pink					3
		dark pink					4
38.		**PQ VG**					
		Petal: color of outer side					
		white					1
		light pink					2
		medium pink					3
		dark pink					4
39.	**(*)**	**QN VG**					
		Fruit: size					
		very small	très petit	sehr klein	muy pequeño		1
		small	petit	klein	pequeño		3
		medium	moyen	mittel	mediano		5
		large	grand	groß	grande	PremP109	7
		very large	très grand	sehr groß	muy grande		9
40.	**(*)**	**QN MS/VG**					
		Fruit: height					
		short					3
		medium					5
		tall					7
41.	**(*)**	**QN MS/VG**					
		Fruit: diameter					
		small					3
		medium				PremP36	5
		large					7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. (*)	**QN MG/VG**	**(+)**				
	Fruit: ratio height/diameter					
	very low					1
	low					3
	medium				PremP36	5
	high					7
	very high					9
43. (*)	**PQ VG**	**(+)**				
	Fruit: shape (in lateral view)					
	ovate					1
	elliptic					2
	circular				PremP109	3
	oblate					4
	obovate					5
44. (*)	**QN VG**	**(+)**				
	Fruit: position of maximum diameter					
	towards stem end					1
	in middle				PremP109	2
	slightly toward calyx end				PremP36	3
	strongly toward calyx end					4
45.	**QN VG**					
	Fruit: symmetry in longitudinal section					
	symmetric or slightly asymmetric	symétrique ou légèrement dissymétrique	symmetrisch oder leicht asymmetrisch	simétrico o ligeramente asimétrico	PremP45	1
	moderately asymmetric	modérément dissymétrique	mäßig asymmetrisch	moderadamente asimétrico	PremP36	2
	strongly asymmetric	fortement dissymétrique	stark asymmetrisch	muy asimétrico		3
46. (*)	**QN VG**	**(+)**				
	Fruit: profile of sides					
	concave					1
	straight				PremP36	2
	convex				PremP109	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
47.	**(*)**	**PQ** **VG**					
		Fruit: ground color					
		not visible					1
		green					2
		yellow green				PremP109	3
		yellow				PremP36	4
		yellow brown					5
		red brown					6
48.	**(*)**	**QN** **VG**					
		Fruit: area of over color					
		absent or very small				PremP36	1
		small					3
		medium					5
		large				PremP109	7
		very large					9
49.	**(*)**	**PQ** **VG**					
		Fruit: hue of over color					
		orange					1
		orange red				PremP45	2
		pink red				PremP109	3
		light red					4
		dark red					5
50.		**QN** **VG**					
		Fruit: intensity of over color					
		light					3
		medium					5
		dark					7
51.		**PQ** **VG**					
		Fruit: pattern of over color					
		weak flush					1
		strong flush					2
		stripe					3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.		**QN MG**					
		Fruit: area of russet around cheeks					
		absent or small					1
		medium					3
		strong					5
53.		**QN VG**					
		Fruit: area of russet around stalk attachment					
		absent or small				PremP36	1
		medium					3
		large					5
54.		**QN VG**					
		Fruit: size of lenticels on skin					
		small					3
		medium	moyen	mittel	medio	PremP109	5
		large					7
55.	**(*)**	**QN VG**					
		Fruit: density of lenticels on skin					
		absent or very sparse					1
		sparse					3
		medium					5
		dense				PremP109	7
56.	**(*)**	**QN MG/VG**					
		Fruit: length of stalk					
		short	court	kurz	corto		3
		medium	moyen	mittel	medio	PremP109	5
		long	long	lang	largo		7
57.	**(*)**	**QN VG**					
		Fruit: thickness of stalk					
		thin					1
		medium				PremP109	3
		thick					5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
58.	**(*)**	**QL VG**	**(+)**				
		Fruit: swelling of stalk					
		absent					1
		present				PremP109	9
59.	**(*)**	**QN VG**					
		Fruit: density of lenticels on stalk					
		absent or very sparse				PremP36	1
		sparse				PremP45	3
		medium				PremP109	5
		dense					7
60.	**(*)**	**QN VG**	**(+)**				
		Fruit: depth of stalk cavity					
		absent or very shallow					1
		shallow				PremP109	2
		medium				PremP45	3
		deep					4
61.	**(*)**	**QN VG**	**(+)**				
		Fruit: persistence of calyx					
		weak				PremP109	1
		medium				PremP45	2
		strong					3
62.		**QN VG**	**(+)**				
		Fruit: attitude of sepals					
		converging					1
		erect				PremP45	2
		spreading				PremP36	3
63.	**(*)**	**QL VG**					
		Fruit: presence of eye in calyx basin					
		absent					1
		present				PremP36	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
64. (*)	**QN VG**	**(+)**				
	Fruit: depth of calyx basin					
	shallow					1
	medium				PremP36	3
	deep				PremP109	5
65.	**PQ VG**					
	Fruit: color of flesh					
	white					1
	yellowish white					2
	whitish yellow					3
	pinkish					4
	red					5
66.	**QN MG/VG**					
	Fruit: firmness of flesh					
	very soft	très molle	sehr weich	muy blanda		1
	soft	molle	weich	blanda		3
	medium	moyenne	mittel	media	PremP109	5
	firm	ferme	fest	firme		7
	very firm	très ferme	sehr fest	muy firme		9
67.	**QN VG**					
	Fruit: texture of flesh					
	fine	fine	fein	fina		1
	medium	intermédiaire	mittel	mediana	PremP36	3
	coarse	grossière	grob	grosera	PremP109	5
68.	**QN VG**					
	Fruit: juiciness of flesh					
	low	faible	gering	baja		3
	medium	moyenne	mittel	media	PremP36	5
	high	forte	hoch	alta	PremP109	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
69.		**QN MG**					
		Fruit: total soluble solids					
		low					3
		medium					5
		high					7
70.		**QN MG**					
		Fruit: acidity					
		low					3
		medium					5
		high					7
71.		**QN MG/VG**	**(+)**				
		Fruit: ratio diameter of core/diameter of fruit					
		very low					1
		low				PremP109	2
		medium					3
		high					4
		very high					5
72.		**QN VG**					
		Fruit: number of locules					
		very few					1
		few					2
		medium				PremP45	3
		many				PremP109	4
73.	**(*)**	**QN MG/VG**					
		Time of beginning of vegetative bud burst					
		early					3
		medium				PremP109	5
		late					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
74.	**(*)**	**QN** **MG/VG**					
		Time of beginning of flowering					
		very early					1
		early				PremP109	3
		medium					5
		late				PremP36	7
		very late					9
75.	**(*)**	**QN** **MG/VG**					
		Time of harvest maturity					
		very early					1
		early				PremP36	3
		medium				PremP45	5
		late				PremP109	7
		very late					9

8. Explanations on the Table of Characteristics

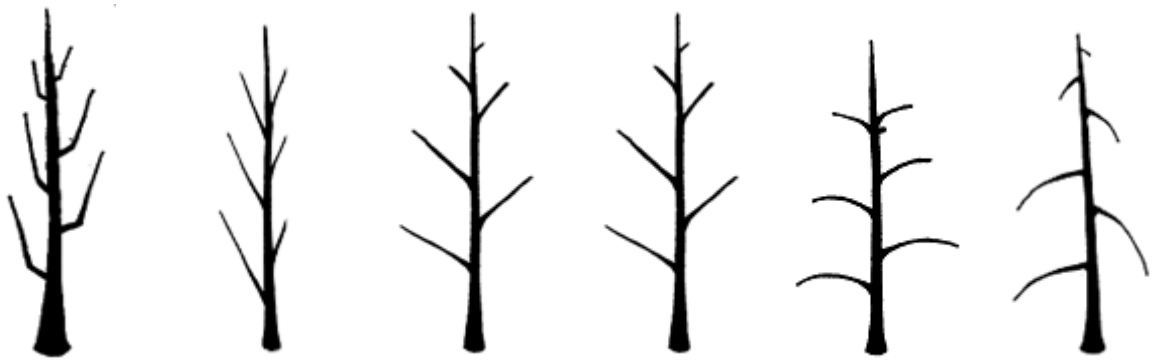
8.1 Explanations covering several characteristics

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.

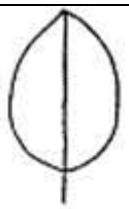
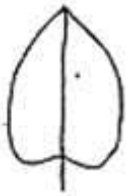
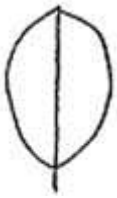
8.2 Explanations for individual characteristics

Ad. 2: Tree: growth habit

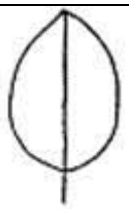
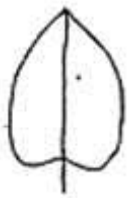
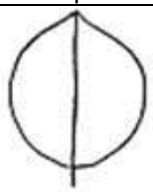
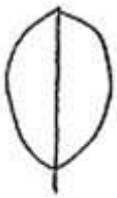


1 fastigiate | 2 upright | 3 semi upright | 4 spreading | 5 drooping | 6 weeping

Ad. 14: Leaf blade: ratio length/width

		← broadest part →			
		below middle	at middle		above middle
width (ratio length/width)					
narrow (high) to broad (low)		 1 ovate	 2 elliptic	 5 cordate	
			 3 circular		 4 obovate

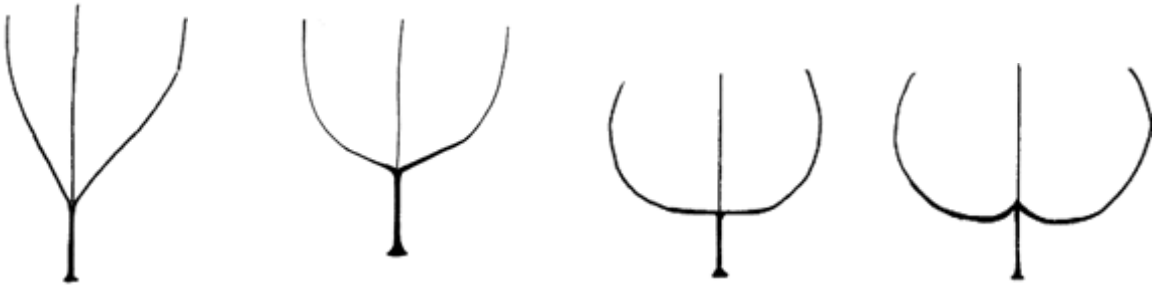
Ad. 15: Leaf blade: shape

		← broadest part →			
		below middle	at middle		above middle
width (ratio length/width)					
narrow (high) to broad (low)		 1 ovate	 2 elliptic	 5 cordate	
			 3 circular		 4 obovate

Ad. 16: Leaf blade: shape of apex

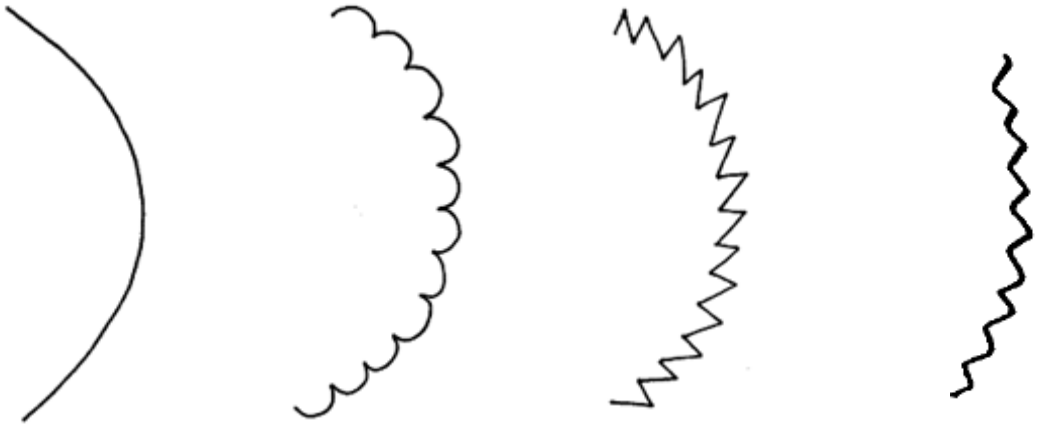
1 acuminate
2 acute
3 obtuse
4 rounded

Ad. 17: Leaf blade: shape of base



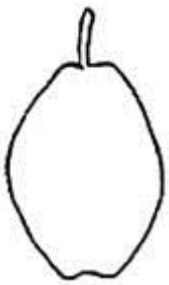
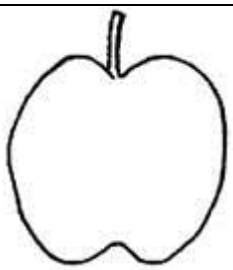
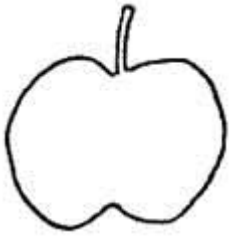
1 acute
2 obtuse
3 truncate
4 cordate

Ad. 19: Leaf blade: incisions of margin (upper half)

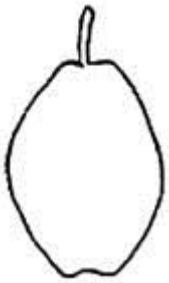
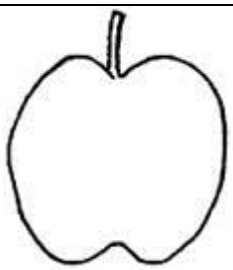
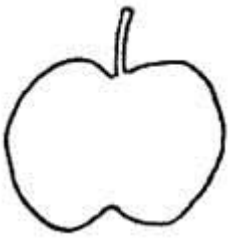


1 entire | 2 crenate | 3 serrate | 4 dentate

Ad. 42: Fruit: ratio height/diameter

		← broadest part →			
		below middle	at middle		above middle
width (ratio length/ width)					
narrow (high)		 1 ovate			 5 obovate
medium (medium)			 3 elliptic	 4 circular	
broad (low)			 2 oblate		

Ad. 43: Fruit: shape (in lateral view)

		← broadest part →			
		below middle	at middle		above middle
width (ratio length/ width)					
narrow (high)		 1 ovate			 5 obovate
medium (medium)			 3 elliptic	 4 circular	
broad (low)			 2 oblate		

Ad. 44: Fruit: position of maximum diameter

1
towards stem end

2
in middle

3
slightly toward calyx end

4
strongly toward calyx end

Ad. 46: Fruit: profile of sides

1
concave

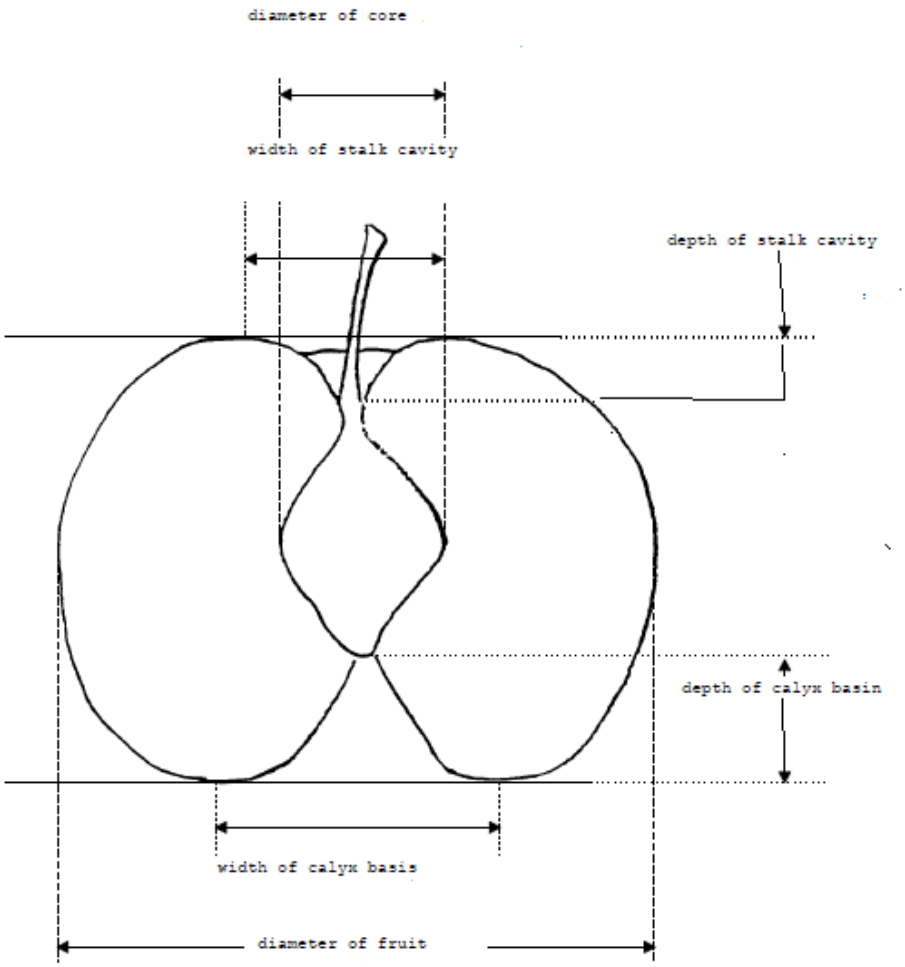
2
straight

3
convex

Ad. 58: Fruit: swelling of stalk

For varieties which express this character, the lower third to half of the stalk has swollen to approximately one and half to twice the diameter of the upper part of the stalk

Ad. 60: Fruit: depth of stalk cavity



Ad. 61: Fruit: persistence of calyx

The sepals on fruit at harvest cab be:

absent or a few = weak persistence
approximately half present = medium persistence
all or almost all present = strong persistence

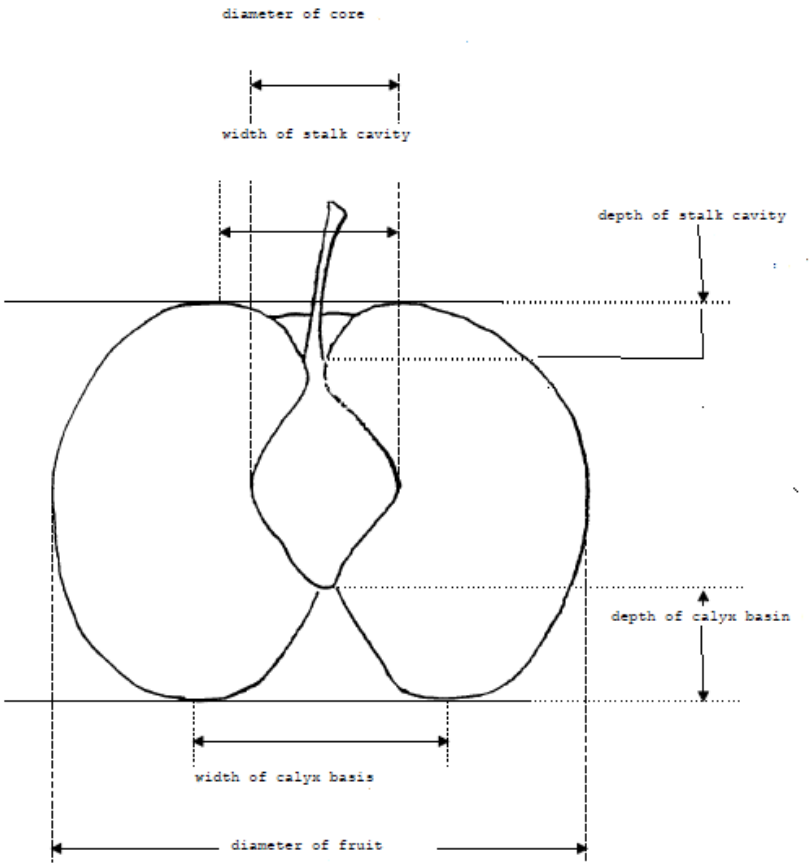
Ad. 62: Fruit: attitude of sepals

1
converging

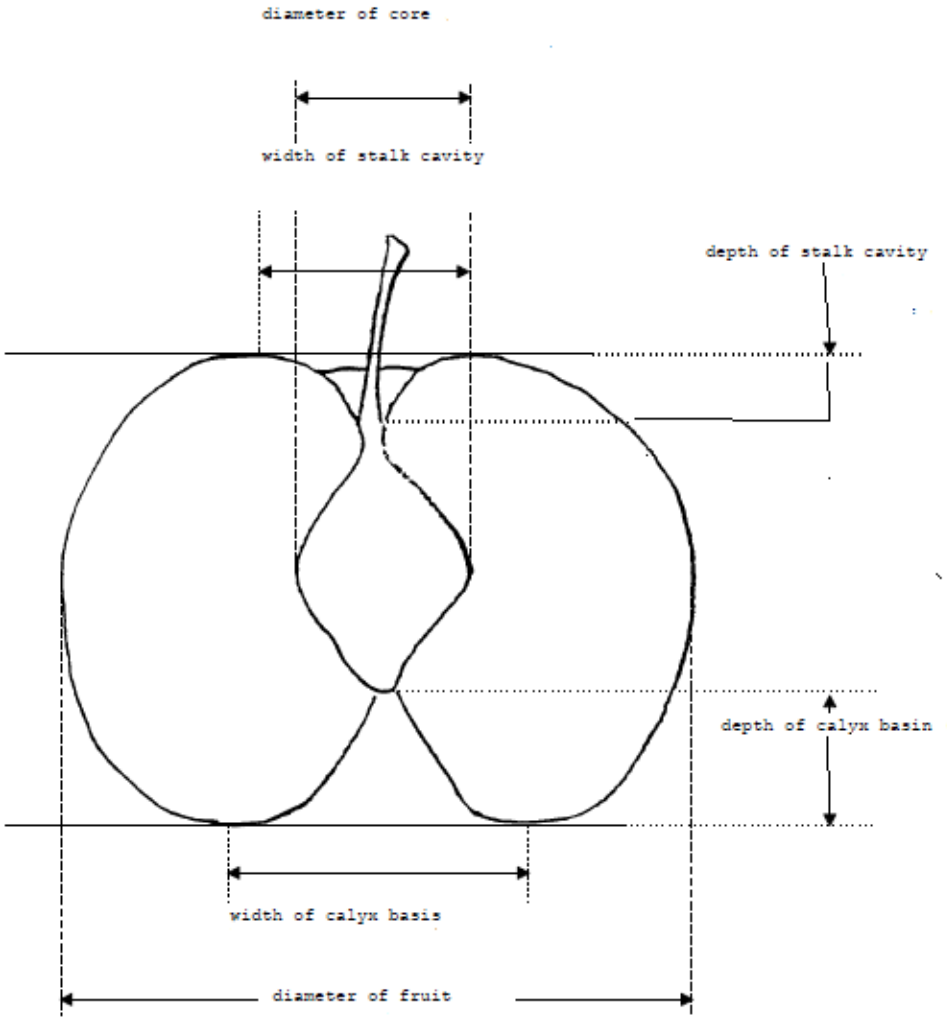
2
erect

3
spreading

Ad. 64: Fruit: depth of calyx basin



Ad. 71: Fruit: ratio diameter of core/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. Heritability and Parental Breeding Value Estimates of Abrasion-Induced Skin Discolouration on Pear Fruit, XIth International Pear Symposium, 23-26 November 2010.

Brewer LR, Alpasch PA, Weskett RH, White AG 2000 Heritability of fruit shape in pears Euphyica

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* ×*lecontei* Rehder	[ ]
1.2.2	Common name		
1.3.1	Botanical name	*Pyrus ussuriensis* Maxim.	[ ]
1.3.2	Common name	Harbin pear, Ussurian pear	
1.4.1	Botanical name	Cross between between two or more of the above species	[ ]
1.4.2	Common name	Pear hybrids	
1.5.1	Botanical name	Cross between one of the above species and *Pyrus comunis*	[ ]
1.5.2	Common name	Pear hybrid	
1.6.1	Botanical name	Cross between one of the above species and *Pyrus pyrifolia*	[ ]
1.6.2	Common name	Pear hybrid	

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)

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:

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)

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**		
	fastigiate		1 [ ]
	upright	PremP109	2 [ ]
	semi upright	PremP45	3 [ ]
	spreading	PremP36	4 [ ]
	drooping		5 [ ]
	weeping		6 [ ]
5.2 (39)	**Fruit: size**		
	very small		1 [ ]
	small		3 [ ]
	medium		5 [ ]
	large	PremP109	7 [ ]
	very large		9 [ ]
5.3 (44)	**Fruit: position of maximum diameter**		
	towards stem end		1 [ ]
	in middle	PremP109	2 [ ]
	slightly toward calyx end	PremP36	3 [ ]
	strongly toward calyx end		4 [ ]
5.4 (46)	**Fruit: profile of sides**		
	concave		1 [ ]
	straight	PremP36	2 [ ]
	convex	PremP109	3 [ ]
5.5 (48)	**Fruit: area of over color**		
	absent or very small	PremP36	1 [ ]
	small		3 [ ]
	medium		5 [ ]
	large	PremP109	7 [ ]
	very large		9 [ ]

	Characteristics	Example Varieties	Note
5.6 (49)	**Fruit: hue of over color**		
	orange		1 [ ]
	orange red	PremP45	2 [ ]
	pink red	PremP109	3 [ ]
	light red		4 [ ]
	dark red		5 [ ]
5.7 (63)	**Fruit: presence of eye in calyx basin**		
	absent		1 [ ]
	present	PremP36	9 [ ]
5.8 (74)	**Time of beginning of flowering**		
	very early		1 [ ]
	early	PremP109	3 [ ]
	medium		5 [ ]
	late	PremP36	7 [ ]
	very late		9 [ ]
5.9 (75)	**Time of harvest maturity**		
	very early		1 [ ]
	early	PremP36	3 [ ]
	medium	PremP45	5 [ ]
	late	PremP109	7 [ ]
	very late		9 [ ]

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
Example	*Fruit: profile of sides*	*straight*	*convex*

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.]

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”.

.....

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]