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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

JAPANESE PEAR

UPOV Code(s): PYRUS_PYR; PYRUS_USS;
PYRUS_PUS; PYRUS_BRE

Pyrus pyrifolia (Burm. f.) Nakai;
Pyrus ussuriensis Maxim. & Rupr.;
Hybrids between *Pyrus pyrifolia* and
Pyrus ussuriensis;
Pyrus x bretschneideri Rehder

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Japan

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 pyrifolia</i> (Burm. f.) Nakai	Asian pear, Chinese pear, Chinese sand pear, Japanese pear, Nashi, Nashi pear, Oriental pear, Sand pear	poirier japonais	Nashi, Sandbirnbaum	pera
<i>Pyrus ussuriensis</i> Maxim. & Rupr.	Harbin pear, Ussurian pear		Ussuri-Birne	
Hybrids between <i>Pyrus pyrifolia</i> and <i>Pyrus ussuriensis</i>				
<i>Pyrus x bretschneideri</i> Rehder, <i>Pyrus pyrifolia</i> x <i>Pyrus bretschneideri</i> , hybrids between <i>Pyrus pyrifolia</i> and <i>Pyrus bretschneideri</i>	Chinese white pear, Chinese white pear, white pear			

* 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.]

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/15/4 European pear

TG/169/3 + Corr. Pyrus Rootstocks

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Pyrus pyrifolia* (Burm. f.) Nakai, *Pyrus ussuriensis* Maxim. & Rupr., Hybrids between *Pyrus pyrifolia* and *Pyrus ussuriensis* and *Pyrus x bretschneideri* Rehder, and its hybrids with other species of *Pyrus* L., except for varieties used only as rootstock varieties (see TG/169/3 + Corr.).

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 grafted on rootstocks 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.

3.4 *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 plants.

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 plants.

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.

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 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. 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) Fruit: weight (characteristic 30)
- (b) Fruit: shape in lateral view (characteristic 34)
- (c) Fruit: ground color of skin (characteristic 35)
- (d) Fruit: relative area of over color (characteristic 36)
- (e) Fruit: hue of over color (aligned states of expression with European Pear) (characteristic 37)
- (f) Fruit: relative area of russet (characteristic 38)
- (g) Time of beginning of flowering (characteristic 61)
- (h) Time of harvest maturity (characteristic 62)

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.

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)-(d) See Explanations on the Table of Characteristics in Chapter 8.1
- 7 Not applicable

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							
		Tree: vigor								
		very weak								1
		weak							Yakumo	2
		medium							Hosui, Kosui, Shinseiki	3
		strong							Shinsui	4
		very strong								5
2.	(*)	PQ	VG	(+)	(a)					
		Tree: growth habit								
		fastigiate								1
		upright							Shinsui	2
		spreading							Niitaka	3
		drooping							Chojuro	4
		weeping								5
3.		QN	MG/MS/VG	(+)	(a)					
		One-year-old shoot: length of internodes								
		short								1
		short to medium							Nijisseiki, Shinsui	2
		medium							Hosui	3
		medium to long							Kosui	4
		long								5
4.	(*)	PQ	VG		(a)					
		One-year-old shoot: color on sunny side								
		dark purple							Oharabeni	1
		medium brown							Chojuro, Niitaka	2
		dark brown							Hosui	3
		orange brown								4
		greenish brown							Gold Nijisseiki	5
5.	(*)	QN	MG/VG		(a)					
		One-year-old shoot: number of lenticels								
		very few								1
		few							Choju	2
		medium							Gold Nijisseiki, Hosui, Kosui, Niitaka	3
		many							Shinko, Shinseiki	4
		very many								5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	(*)	QN	VG		(a)				
		One-year-old shoot: size of lenticels							
		small						Chojuro, Shinseiki	1
		medium						Gold Nijisseiki, Hosui, Kosui	2
		large						Niitaka, Shinsui	3
7.		QN	VG		(a)				
		One-year-old shoot: density of pubescence							
		absent or very sparse						Hosui, Kosui	1
		sparse							2
		medium						Shinko	3
		dense							4
		very dense						Gold Nijisseiki	5
8.	(*)	QN	VG	(+)					
		One-year-old shoot: position of vegetative bud in relation to shoot							
		adpressed						Kosui, Shinsui	1
		slightly held out						Chojuro, Hosui, Nijisseiki	2
		markedly held out						Niitaka, Shinko	3
9.		PQ	VG	(+)					
		One-year-old shoot: shape of apex of vegetative bud							
		acute						Gold Nijisseiki, Kosui	1
		slightly rounded						Hosui, Shinko	2
		strongly rounded						Shinsui	3
10.	(*)	QN	VG		(a)				
		One-year-old shoot: number of axillary flower buds							
		very few							1
		few						Gold Nijisseiki, Shinsui	2
		medium						Kosui, Shinseiki	3
		many						Chojuro, Hosui	4
		very many							5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	(*)	QN	VG						
		Branch: number of spurs							
		few						Kosui	1
		few to medium							2
		medium						Hosui	3
		medium to many							4
		many						Gold Nijisseiki, Shinko, Shinsui	5
12.	(*)	PQ	VG						
		Flower bud: shape							
		ovate						Chojuro, Gold Nijisseiki, Kosui	1
		narrow elliptic						Hosui	2
		broad elliptic						Shinsui	3
		circular						Aikansui, Shinseiki	4
13.	(*)	PQ	VG						
		Young leaf: color of upper side							
		yellow green						Chikusui, Shinseiki	1
		greenish brown						Yakumo	2
		brown						Gold Nijisseiki, Hosui, Kosui	3
		red brown						Shinko, Shinsui	4
14.	(*)	QN	VG						
		Young leaf: density of pubescence on lower side							
		absent or very sparse							1
		sparse						Hosui, Kosui, Shinsui	2
		medium						Aikansui, Chojuro, Niitaka	3
		dense						Gold Nijisseiki, Shinseiki	4
		very dense							5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.	(*)	QN	MG/MS/VG		(b)				
		Leaf blade: length							
		very short							1
		very short to short							2
		short						Hosui, Shinsui	3
		short to medium							4
		medium						Gold Nijisseiki, Kosui	5
		medium to long							6
		long						Nansui	7
		long to very long							8
		very long							9
16.	(*)	QN	MG/MS/VG		(b)				
		Leaf blade: width							
		very narrow							1
		very narrow to narrow							2
		narrow						Hosui, Shinko	3
		narrow to medium							4
		medium						Shinsui	5
		medium to broad							6
		broad						Niitaka	7
		broad to very broad							8
		very broad							9
17.	(*)	QN	MG/MS/VG		(b)				
		Leaf blade: ratio length/width							
		very low							1
		very low to low							2
		low						Niitaka	3
		low to medium						Akizuki	4
		medium						Gold Nijisseiki	5
		medium to high						Hosui	6
		high						Kosui	7
		high to very high							8
		very high							9
18.		PQ	VG	(+)	(b)				
		Leaf blade: incisions of margin							
		serrate							1
		dentate							2
		crenate							3

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	(*)	QN	MG/MS/VG		(b)				
		Petiole: length							
		very short							1
		very short to short							2
		short						Niitaka, Shinko	3
		short to medium						Gold Nijisseiki	4
		medium						Tama	5
		medium to long							6
		long						Yakumo	7
		long to very long							8
		very long							9
20.		QN	MG/MS/VG		(b)				
		Petiole: ratio petiole length / leaf blade length							
		very low							1
		low						Kikusui, Niitaka	2
		medium						Hosui, Kosui	3
		high						Yakumo	4
		very high							5
21.	(*)	QN	MG/MS/VG						
		Inflorescence: number of flowers							
		few							1
		few to medium							2
		medium						Chojuro, Hosui, Shinsui	3
		medium to many							4
		many						Gold Nijisseiki, Kosui	5
22.	(*)	PQ	VG						
		Petal: color of outer side just before opening of flower							
		white						Niitaka, Shinko, Shinseiki	1
		light pink						Hosui, Kosui, Shinsui	2
		medium pink						Choju	3
		light red						Oharabeni	4

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23.	(*)	QN	MG/MS/VG		(c)				
		Flower: diameter							
		small						Atago	1
		small to medium							2
		medium						Chojuro, Gold Nijisseiki, Shinsui	3
		medium to large							4
		large						Hosui, Kosui	5
24.	(*)	PQ	VG	(+)	(c)				
		Petal: shape							
		ovate						Hosui, Shinko	1
		elliptic						Kosui	2
		circular						Chojuro, Gold Nijisseiki, Niitaka	3
25.		QN	VG	(+)	(c)				
		Petal: number of notches on margin							
		absent or few						Aikansui, Niitaka	1
		medium						Gold Nijisseiki, Hosui, Kosui, Shinsui	2
		many						Chojuro, Shinseiki	3
26.	(*)	QN	MG/MS/VG		(c)				
		Flower: number of stamens							
		very few							1
		few						Chojuro	2
		medium						Hosui, Niitaka	3
		many						Kikusui, Kosui	4
		very many							5
27.		QN	VG	(+)					
		Anther: intensity of red color							
		light						Kosui, Niitaka	1
		medium						Hosui, Shinsui	2
		dark						Gold Nijisseiki, Shinko	3
28.	(*)	QL	VG						
		Anther: pollen							
		absent						Ishiiwase, Kumoi, Niitaka	1
		present						Chojuro, Hosui, Kosui, Nijisseiki, Shinsui	9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29.		QN	VG		(c)				
	Pedicel: density of pubescence								
	very sparse								1
	sparse								2
	medium							Hosui, Kosui	3
	dense							Nijisseiki, Shinko, Shinseiki	4
	very dense								5
30.	(*)	QN	MG/MS		(d)				
	Fruit: weight								
	very low								1
	very low to low								2
	low							Shinsui	3
	low to medium								4
	medium							Chojuro, Gold Nijisseiki, Kosui	5
	medium to high								6
	high							Hosui, Shinko	7
	high to very high							Niitaka	8
	very high							Atago	9
31.	(*)	QN	MG/MS/VG	(+)	(d)				
	Fruit: height								
	very short								1
	very short to short								2
	short							Shinsui	3
	short to medium								4
	medium							Kosui	5
	medium to tall							Gold Nijisseiki, Hosui	6
	tall							Niitaka, Shinko	7
	tall to very tall							Atago	8
	very tall								9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32.	(*)	QN	MG/MS/VG	(+)	(d)				
		Fruit: diameter							
		very small							1
		very small to small							2
		small							3
		small to medium						Shinsui	4
		medium						Gold Nijisseiki, Kosui	5
		medium to large							6
		large						Hosui, Shinko	7
		large to very large						Niitaka	8
		very large						Atago	9
33.	(*)	QN	MG/MS/VG	(+)	(d)				
		Fruit: ratio height/diameter							
		very low							1
		very low to low							2
		low						Shinsui	3
		low to medium						Atago, Hosui, Kosui, Niitaka	4
		medium						Gold Nijisseiki, Shinko	5
		medium to high							6
		high							7
		high to very high							8
		very high							9
34.	(*)	PQ	VG	(+)	(d)				
		Fruit: shape in lateral view							
		ovate							1
		narrow elliptic							2
		broad elliptic						Yakumo	3
		circular						Hosui	4
		oblate						Shinsui	5
		obovate						Yasato	6
35.	(*)	PQ	VG		(d)				
		Fruit: ground color of skin							
		not visible						Hosui, Niitaka, Shinko	1
		yellow							2
		green							3
		light yellow green						Yakumo	4
		dark yellow green						Gold Nijisseiki	5

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
36.	(*)	PQ	VG						
	Fruit: relative area of over color								
	absent or very small							Hosui, Kosui	1
	small								2
	medium								3
	large							PremP109	4
	very large								5
37.	(*)	PQ	VG						
	Fruit: hue of over color (aligned states of expression with European Pear)								
	orange								1
	orange red								2
	pink red							PremP109	3
	red								4
	purple								5
38.	(*)	PQ	VG	(+)	(d)				
	Fruit: relative area of russet								
	absent or very small							Gold Nijisseiki	1
	small								2
	medium							Chikusui	3
	large							Kosui	4
	very large							Hosui, Niitaka, Shinko	5
39.	(*)	PQ	VG		(d)				
	Fruit: color of russet								
	yellow brown							Chikusui	1
	yellowish red brown							Hosui, Kosui, Shinko	2
	red brown							Chojuro	3
40.	(*)	QN	VG		(d)				
	Fruit: texture of russet								
	very smooth								1
	smooth							Shinsui	2
	medium							Kosui, Niitaka, Shinko	3
	rough							Hosui	4
	very rough								5

		English		français		deutsch		español		Example Varieties Exemples Beispielssorten Variedades ejemplo		Note/ Nota
41.	(*)	QN	VG		(d)							
		Fruit: size of lenticels										
		small							Shinseiki, Yakumo	1		
		small to medium								2		
		medium							Gold Nijisseiki, Hosui, Kosui, Niitaka	3		
		medium to large								4		
		large							Kimizuka Wase	5		
42.	(*)	QN	VG		(d)							
		Fruit: density of lenticels										
		very sparse								1		
		sparse								2		
		medium							Kosui, Shinko	3		
		dense							Gold Nijisseiki, Hosui, Niitaka	4		
		very dense								5		
43.	(*)	QN	MG/MS/VG	(+)	(d)							
		Fruit: depth of stalk cavity										
		shallow								1		
		shallow to medium							Gold Nijisseiki	2		
		medium							Kosui	3		
		medium to deep								4		
		deep								5		
44.	(*)	QN	MG/MS/VG	(+)	(d)							
		Fruit: depth of calyx basin										
		shallow								1		
		shallow to medium							Aikansui	2		
		medium							Hosui	3		
		medium to deep							Shinsui	4		
		deep								5		
45.	(*)	QN	MG/MS/VG	(+)	(d)							
		Fruit: width of stalk cavity										
		narrow								1		
		narrow to medium								2		
		medium							Gold Nijisseiki, Hosui	3		
		medium to broad							Shinko	4		
		broad							Aikansui	5		

		English		français		deutsch		español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46.	(*)	QN	MG/MS/VG	(+)	(d)					
		Fruit: width of calyx basin								
		narrow								1
		narrow to medium							Chikusui	2
		medium							Gold Nijisseiki, Hosui	3
		medium to broad								4
		broad							Kosui, Niitaka, Shinsui	5
47.		QN	VG	(+)	(d)					
		Fruit: tendency to form fruits with persistent calyx								
		absent or weak							Gold Nijisseiki, Hosui, Kosui	1
		medium							Yasato	2
		strong							Akizuki	3
48.	(*)	QN	MG/MS/VG		(d)					
		Fruit: length of stalk								
		short							Chikusui	1
		short to medium								2
		medium							Gold Nijisseiki, Hosui, Kosui	3
		medium to long								4
		long							Okusankichi	5
49.	(*)	QN	MG/MS/VG	(+)	(d)					
		Fruit: thickness of stalk								
		thin							Hosui	1
		thin to medium								2
		medium							Kosui, Niitaka	3
		medium to thick								4
		thick							Gold Nijisseiki	5
50.	(*)	QL	VG	(+)	(d)					
		Fruit: swelling of stalk								
		absent							Hosui, Niitaka, Shinko	1
		present							Gold Nijisseiki, Kosui	9
51.	(*)	PQ	VG	(+)	(d)					
		Fruit: shape of core								
		narrow ovate							Yakumo	1
		broad ovate							Kosui	2
		narrow fusiform							Kumoi	3
		broad fusiform							Gold Nijisseiki, Hosui, Niitaka	4

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.	(*)	QN	MG/MS/VG	(+)	(d)				
	Fruit: ratio width of core/diameter of fruit								
	very low								1
	low						Kosui		2
	medium						Gold Nijisseiki, Hosui		3
	high						Shinko		4
	very high								5
53.	(*)	QL	VG		(d)				
	Fruit: number of locules								
	only 5						Gold Nijisseiki, Hosui, Niitaka		1
	more than 5						Kosui		2
54.	(*)	PQ	VG		(d)				
	Fruit: color of flesh								
	white						Hosui, Niitaka		1
	yellowish white						Gold Nijisseiki		2
	whitish yellow						Shinko		3
	pinkish								4
55.	(*)	QN	MG/MS/VG	(+)	(d)				
	Fruit: firmness of flesh								
	soft						Gold Nijisseiki, Kosui		1
	soft to medium								2
	medium						Niitaka		3
	medium to firm								4
	firm						Chojuro		5
56.		QN	VG		(d)				
	Fruit: texture of flesh								
	fine						Hosui, Kosui		1
	fine to medium								2
	medium						Shinko, Shinsui		3
	medium to coarse								4
	coarse						Chojuro		5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
57.	QN	MG	(+)	(d)				
	Fruit: sweetness							
	very low							1
	low						Kumoi	2
	medium						Gold Nijisseiki, Shinko	3
	high						Hosui, Shinsui	4
	very high							5
58.	QN	MG	(+)	(d)				
	Fruit: acidity							
	very low							1
	low						Kosui	2
	medium						Shinsui	3
	high						Hosui	4
	very high							5
59.	QN	VG		(d)				
	Seed: size							
	small							1
	small to medium						Chikusui	2
	medium						Gold Nijisseiki, Hosui, Kosui	3
	medium to large						Niitaka	4
	large							5
60.	PQ	VG	(+)	(d)				
	Seed: shape							
	falcate							1
	narrow ovate						Shinko	2
	broad ovate						Gold Nijisseiki, Hosui, Niitaka	3
61.	(*)	QN	MG/VG	(+)				
	Time of beginning of flowering							
	very early							1
	very early to early							2
	early						Niitaka	3
	early to medium							4
	medium						Gold Nijisseiki, Hosui, Shinsui	5
	medium to late							6
	late						Kosui, Okusankichi	7
	late to very late							8
	very late							9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
62.	(*)	QN	MG/VG	(+)					
	Time of harvest maturity								
	very early								1
	very early to early						Aikansui		2
	early						Shinsui		3
	early to medium								4
	medium						Gold Nijisseiki, Hosui		5
	medium to late								6
	late						Niitaka		7
	late to very late						Shinko		8
	very late						Okusankichi		9
63.		QL	VG	(+)					
	Self-compatibility								
	absent						Gold Nijisseiki, Hosui, Kosui, Niitaka		1
	present						Osa Gold, Osa Nijisseiki		9
64.		QL	VG	(+)					
	Resistance to <i>Alternaria alternata</i> Japanese pear pathotype								
	absent						Nansui, Nijisseiki, Osa Nijisseiki, Shinsui		1
	present						Hosui, Kosui, Niitaka		9

8. Explanations on the Table of Characteristics

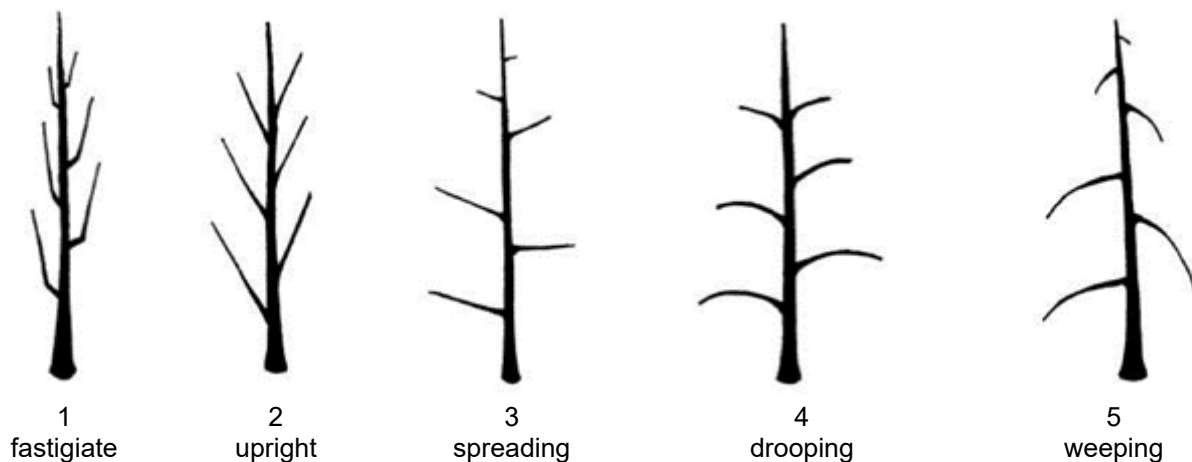
8.1 *Explanations covering several characteristics*

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

- (a) Observations should be made during winter on trees that have fruited at least once.
- (b) Observations should be made on fully developed leaves from the middle third of current season shoot.
- (c) Observations should be made on fully developed flowers at the beginning of anther dehiscence.
- (d) Observations should be made on fruits at harvest maturity.

8.2 *Explanations for individual characteristics*

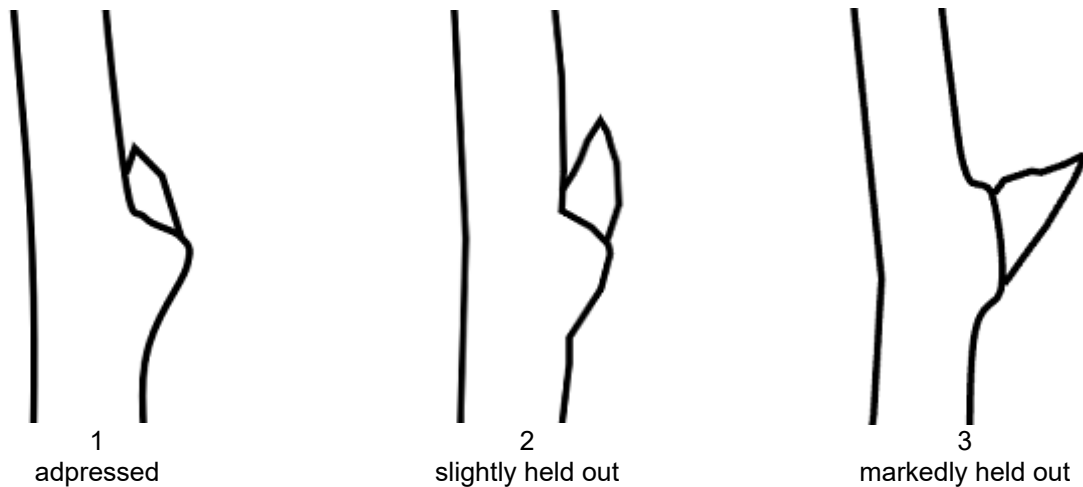
Ad. 2: Tree: growth habit



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

Observation should be made on the middle third of the shoot.

Ad. 8: One-year-old shoot: position of vegetative bud in relation to shoot



Ad. 9: One-year-old shoot: shape of apex of vegetative bud



1
pointed

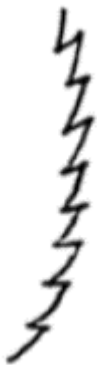


2
slightly rounded



3
strongly rounded

Ad. 18: Leaf blade: incisions of margin



1
serrate

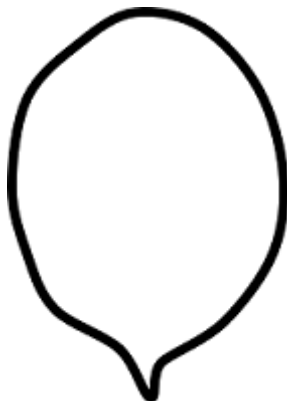


2
dentate

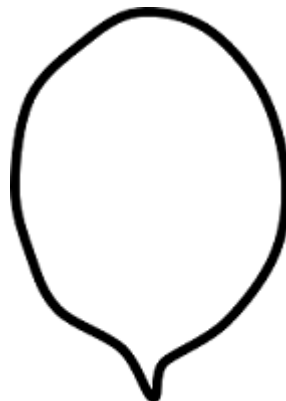


3
crenate

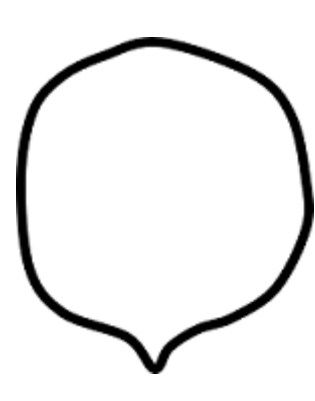
Ad. 24: Petal: shape



1
ovate



2
elliptic



3
circular

Ad. 25: Petal: number of notches on margin



1
absent or few



2
medium

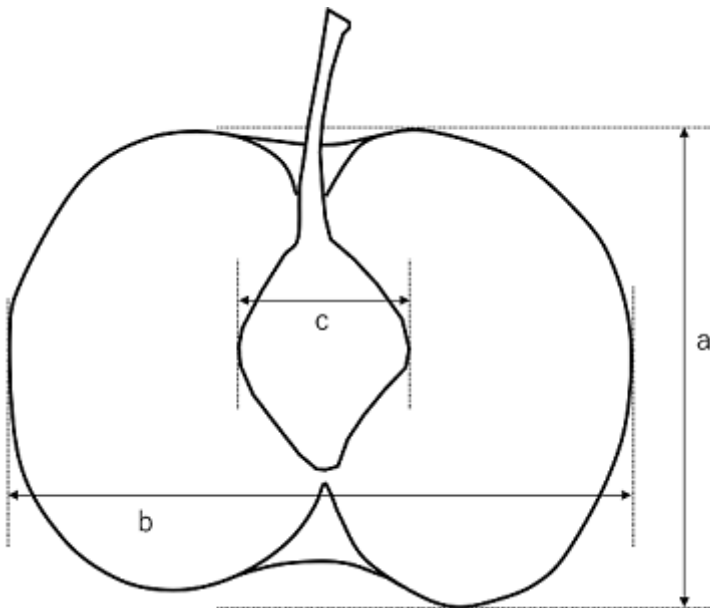


3
many

Ad. 27: Anther: intensity of red color

Observations should be made before dehiscence.

Ad. 31: Fruit: height



a= Fruit: height
b= Fruit: diameter
a/b= Fruit: ratio height/diameter
c/b= Fruit: ratio width of core/diameter of fruit

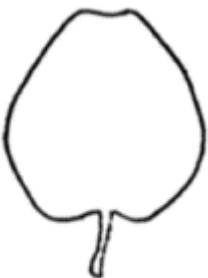
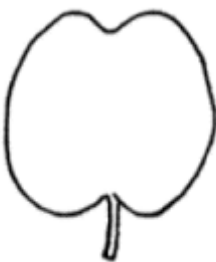
Ad. 32: Fruit: diameter

See Ad. 31

Ad. 33: Fruit: ratio height/diameter

See Ad. 31

Ad. 34: Fruit: shape in lateral view

		← broadest part →		
		below middle	at middle	above middle
ratio length/width				
high			 2 narrow elliptic	
medium			 3 broad elliptic	
		 1 ovate	 4 round	 6 obovate
low			 5 oblate	

Ad. 38: Fruit: relative area of russet



1
absent or very small

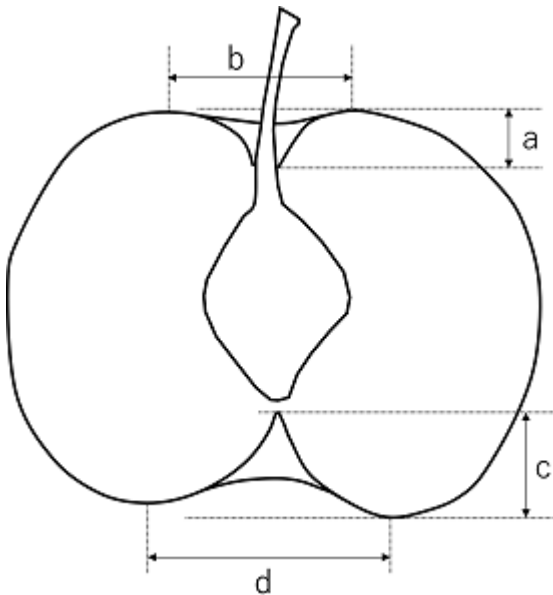


3
medium



5
very large

Ad. 43: Fruit: depth of stalk cavity



a= Fruit: depth of stalk cavity
b= Fruit: width of stalk cavity
c= Fruit: depth of calyx basin
d= Fruit: width of calyx basin

Ad. 44: Fruit: depth of calyx basin

See Ad. 43

Ad. 45: Fruit: width of stalk cavity

See Ad. 43

Ad. 46: Fruit: width of calyx basin

See Ad. 43

Ad. 47: Fruit: tendency to form fruits with persistent calyx

- (1) absent or weak: fruits with persistent calyx are none or very few.
- (2) medium: fruits with persistent calyx are sometimes present.
- (3) strong: all or most of the fruits have persistent calyx.

Ad. 49: Fruit: thickness of stalk

Observation should be made on the middle of the stalk.

Ad. 50: Fruit: swelling of stalk

Observations should be made at the base of the stalk.

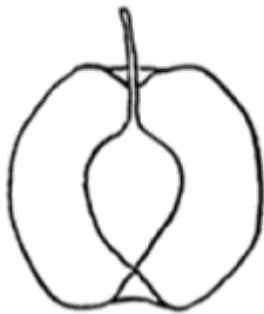


1
absent

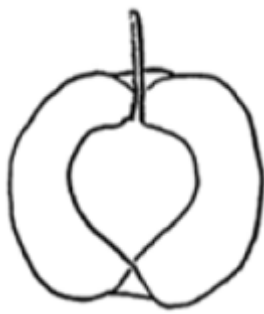


9
present

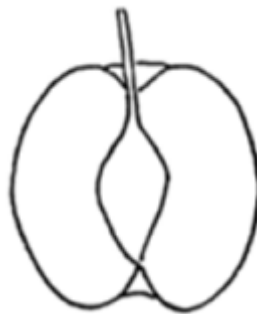
Ad. 51: Fruit: shape of core



1
narrow ovate



2
broad ovate



3
narrow fusiform



4
broad fusiform

Ad. 52: Fruit: ratio width of core/diameter of fruit

See Ad. 31

Ad. 55: Fruit: firmness of flesh

Observation can be made by measurement using penetrometer.

Ad. 57: Fruit: sweetness

Sweetness can be determined by measurement using a refractometer.

Ad. 58: Fruit: acidity

The acidity can be determined by titration, pH meter, or tasting.

Ad. 60: Seed: shape



1

falcate



2

narrow ovate



3

broad ovate

Ad. 61: Time of beginning of flowering

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

Ad. 62: Time of harvest maturity

Japanese pear fruits ripen on the tree and do not require post-harvest ripening. The time of harvest maturity is reached when the fruit has reached its optimum flavor.

Ad. 63: Self-compatibility

Many Japanese Pear varieties are self-incompatible, and require pollination with pollen from other varieties. Self-compatibility can be determined by the ratio of fruit set by self-pollination.

Just after opening, the flowers should be self-pollinated artificially, and bagged.

After 90 days, observe the ratio shown below.

(Number of fruit set / Number of flowers artificially self-pollinated)

Self-compatible varieties show a fruiting ratio of 30% or more, and self-incompatible varieties set fruits less than 30%.

Ad. 64: Resistance to *Alternaria alternata* Japanese pear pathotype

1.	Pathogen	<i>Alternaria alternata</i> Japanese pear pathotype
2.	Quarantine status	
3.	Host species	Japanese Pear - <i>Pyrus pyrifolia</i> (Burm. f.) Nakai var. <i>culta</i> (Mak.) Nakai
4.	Source of inoculum	MAFF (JP)
5.	Isolate	(To be added)
6.	Establishment isolate identity	resistant and susceptible controls
7.	Establishment pathogenicity	Test on susceptible plants
8.	Multiplication inoculum	
8.1	Multiplication medium	Potato dextrose agar
9.	Format of the test	
9.1	Number of plants per genotype	3
9.2	Number of replicates	See 10.4
9.3	Control varieties	Susceptible controls: Nansui, Njisseiki, Osa Nijisseiki, Shinsui Resistant controls: Hosui, Niitaka
9.5	Test facility	Petri dishes in an incubator
9.6	Temperature	25°C all day
10.	Inoculation	
10.2	Quantification inoculum	2.5×10^4 spores/ml
10.3	Plant stage at inoculation	Sampling from the second to the fourth leaf on the shoot towards the base (three leaves) per plant. The first leaf is determined as the leaf that has just unfolded at the top of a new shoot.
10.4	Inoculation method	Two filter papers are moistened in petri dishes with distilled and sterilized water. Leaf disks are detachedly arranged on the papers. 4-6 drops of the spore suspension (about 40 ul per drop) are placed on each leaf.
10.7	Final observations	4 days after inoculation
11.	Observations	
11.1	Method	Visual
11.2	Observation scale	resistant = no symptoms susceptible = necrosis on the marginal zone or whole surface
11.3	Validation of test	Evaluation of variety resistance should be calibrated with results of resistant and susceptible controls.
12.	Interpretation of data in terms of UPOV characteristic states	Absent (susceptible) [1] Present (resistant) [9]

9. Literature

Abe, K., Kurihara A., 1993: Species and varietal differences in scab resistance of pear. Journal of the Japanese Society for Horticultural Science. JP, PP. 789-794.

Nishio, S. et al., 2022: Marker-assisted Selection of Agronomically Important Traits in Japanese Pear Breeding Programs. Hort. Res. JP, 21(2), pp. 137-147.

Saito, T. et al., 2021: New Japanese pear cultivar 'Hoshiakari'. Journal of the NARO Research and Development (7). JP, pp. 21-28.

Saito, T. et al., 2021: New Japanese pear cultivar 'Narumi'. Journal of the NARO Research and Development (7). JP, pp. 29-37.

Kanahama, K., 2015: The fruit horticulture. Buneido Publishing Co., Ltd. Tokyo, JP, pp. 125-158.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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		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 | <i>Pyrus pyrifolia</i> (Burm. f.) Nakai | ☐ |
| 1.1.2 | Common name | Asian pear, Chinese pear, Chinese sand pear, Japanese pear, Nashi, Nashi pear, Oriental pear, Sand pear | |
| 1.2.1 | Botanical name | <i>Pyrus ussuriensis</i> Maxim. & Rupr. | ☐ |
| 1.2.2 | Common name | Harbin pear, Ussurian pear | |
| 1.3.1 | Botanical name | Hybrids between <i>Pyrus pyrifolia</i> and <i>Pyrus ussuriensis</i> | ☐ |
| 1.3.2 | Common name | | |
| 1.4.1 | Botanical name | <i>Pyrus x bretschneideri</i> Rehder | ☐ |
| 1.4.2 | Common name | Chinese white pear, Chinese white pear, white pear | |
| 1.5.1 | Botanical name | Species (please indicate) | ☐ |
| 1.5.2 | 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:
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#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:
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4.2

Method of propagating the variety

4.2.1

Vegetative propagation

(a) *In vitro* propagation

(b) Budding or grafting

(c) 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		1 []
	upright	Shinsui	2 []
	spreading	Niitaka	3 []
	drooping	Chojuro	4 []
	weeping		5 []
5.2 (10)	One-year-old shoot: number of axillary flower buds		
	very few		1 []
	few	Gold Nijisseiki, Shinsui	2 []
	medium	Kosui, Shinseiki	3 []
	many	Chojuro, Hosui	4 []
	very many		5 []
5.3 (11)	Branch: number of spurs		
	few	Kosui	1 []
	few to medium		2 []
	medium	Hosui	3 []
	medium to many		4 []
	many	Gold Nijisseiki, Shinko, Shinsui	5 []
5.4 (13)	Young leaf: color of upper side		
	yellow green	Chikusui, Shinseiki	1 []
	greenish brown	Yakumo	2 []
	brown	Gold Nijisseiki, Hosui, Kosui	3 []
	red brown	Shinko, Shinsui	4 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics		Example Varieties	Note
5.5 (15)	Leaf blade: length		
	very short		1 []
	very short to short		2 []
	short	Hosui, Shinsui	3 []
	short to medium		4 []
	medium	Gold Nijisseiki, Kosui	5 []
	medium to long		6 []
	long	Nansui	7 []
	long to very long		8 []
	very long		9 []
5.6 (30)	Fruit: weight		
	very low		1 []
	very low to low		2 []
	low	Shinsui	3 []
	low to medium		4 []
	medium	Chojuro, Gold Nijisseiki, Kosui	5 []
	medium to high		6 []
	high	Hosui, Shinko	7 []
	high to very high	Niitaka	8 []
	very high	Atago	9 []
5.7 (34)	Fruit: shape in lateral view		
	ovate		1 []
	narrow elliptic		2 []
	broad elliptic	Yakumo	3 []
	circular	Hosui	4 []
	oblate	Shinsui	5 []
	obovate	Yasato	6 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
	Characteristics	Example Varieties	Note
5.8 (35)	Fruit: ground color of skin		
	not visible	Hosui, Niitaka, Shinko	1 []
	yellow		2 []
	green		3 []
	light yellow green	Yakumo	4 []
	dark yellow green	Gold Nijisseiki	5 []
5.9 (36)	Fruit: relative area of over color		
	absent or very small	Hosui, Kosui	1 []
	small		2 []
	medium		3 []
	large	PremP109	4 []
	very large		5 []
5.10 (37)	Fruit: hue of over color (aligned states of expression with European Pear)		
	orange		1 []
	orange red		2 []
	pink red	PremP109	3 []
	red		4 []
	purple		5 []
5.11 (38)	Fruit: relative area of russet		
	absent or very small	Gold Nijisseiki	1 []
	small		2 []
	medium	Chikusui	3 []
	large	Kosui	4 []
	very large	Hosui, Niitaka, Shinko	5 []
5.12 (39)	Fruit: color of russet		
	yellow brown	Chikusui	1 []
	yellowish red brown	Hosui, Kosui, Shinko	2 []
	red brown	Chojuro	3 []

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties		Note
5.13 (61)	Time of beginning of flowering		
	very early		1 []
	very early to early		2 []
	early	Niitaka	3 []
	early to medium		4 []
	medium	Gold Nijisseiki, Hosui, Shinsui	5 []
	medium to late		6 []
	late	Kosui, Okusankichi	7 []
	late to very late		8 []
	very late		9 []
5.14 (62)	Time of harvest maturity		
	very early		1 []
	very early to early	Aikansui	2 []
	early	Shinsui	3 []
	early to medium		4 []
	medium	Gold Nijisseiki, Hosui	5 []
	medium to late		6 []
	late	Niitaka	7 []
	late to very late	Shinko	8 []
	very late	Okusankichi	9 []
5.15 (63)	Self-compatibility		
	absent	Gold Nijisseiki, Hosui, Kosui, Niitaka	1 []
	present	Osa Gold, Osa Nijisseiki	9 []
	not tested		
5.16 (64)	Resistance to <i>Alternaria alternata</i> Japanese pear pathotype		
	absent	Nansui, Nijisseiki, Osa Nijisseiki, Shinsui	1 []
	present	Hosui, Kosui, Niitaka	9 []
	not tested		

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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>	<i>One-year-old shoot: number of lenticels</i>	<i>few</i>	<i>many</i>

Comments

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#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.

- Pollinizer:

Good pollinizers are the following varieties:

.....

	absent	present	not tested
- Self-compatibility (62)	☐	☐	☐
- Resistance to pests and diseases			
i) <i>Erwinia amylovora</i>	☐	☐	☐
ii) <i>Physalospora piricola</i> Nose	☐	☐	☐
iii) <i>Phomopsis fukushii</i> Tanaka et Endo	☐	☐	☐
iv) <i>Corynespora melonis</i>	☐	☐	☐

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

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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]