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## INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

### APPLE

UPOV Code(s): MALUS\_DOM

*Malus domestica* (Suckow) Borkh.

### GUIDELINES

#### FOR THE CONDUCT OF TESTS

#### FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from Germany*

*to be considered by*

*the Technical Committee at its fifty-eighth session  
 to be held in Geneva on October 24 and 25, 2022*

*Disclaimer: this document does not represent UPOV policies or guidance*

Alternative names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Malus domestica</i> (Suckow) Borkh.	Apple	Pommier, Pommier commun	Apfel, Kultur-Apfel	Manzano

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/163 Apple Rootstocks  
 TG/192 Ornamental Apple

\* 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](http://www.upov.int)), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Malus domestica* (Suckow) Borkh. except for varieties used only as rootstock varieties (see TG/163) or only as ornamental varieties (see TG/192).

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 budsticks or graftwood.
- 2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:
- (a) varieties resulting from crossing:  
5 trees; 5 budsticks; or 5 dormant shoots for grafting;
  - (b) varieties resulting from mutation:  
10 trees; 10 budsticks; or 10 dormant 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 bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.
- 3.1.5 The 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 number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

### 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.
- 3.4.3 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 3 plants or parts of plants 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: type (characteristic 2)
  - (b) Only varieties with Tree type: ramified: Tree: habit (characteristic 3)
  - (c) Fruit: shape (characteristic 26)
  - (d) Fruit: hue of over color (characteristic 30)
  - (e) Fruit: relative area of over color (characteristic 32)
  - (f) Fruit: pattern of over color (characteristic 33)
  - (g) Fruit: main color of flesh (characteristic 45)
  - (h) Time of beginning of flowering (characteristic 49)
  - (i) Time of eating maturity (characteristic 51)
- 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)-(g) 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 caractères/Merkmalstabelle/Tabla de caracteres

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(a)</b>	<b>00</b>			
	<b>Tree: vigor</b>	<b>Arbre : vigueur</b>	<b>Baum: Wuchsstärke</b>	<b>Árbol: vigor</b>				
	very weak	très faible	sehr gering	muy débil	Grenadier, Nield's Drooper		1	
	very weak to weak	très faible à faible	sehr gering bis gering	muy débil a débil	James Grieve, Redkan		2	
	weak	faible	gering	débil	Alkmene, Regine		3	
	weak to medium	faible à moyenne	gering bis mittel	débil a medio	Piros, Pomforyou, Renora		4	
	medium	moyenne	mittel	medio	Gala, Pinova, Trajan		5	
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte	Dalili, Pia, Pivita		6	
	strong	forte	stark	fuerte	Elstar, Rafzubin, Santana		7	
	strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte	Bay 3484, Collina, Cripps Pink		8	
	very strong	très forte	sehr stark	muy fuerte	Gloster, Ingrid Marie		9	
<b>2. (*)</b>	<b>QL</b>	<b>VG</b>	<b>(a)</b>	<b>00</b>				
	<b>Tree: type</b>	<b>Arbre : type</b>	<b>Baum: Typ</b>	<b>Árbol: tipo</b>				
	columnar	columnaire	säulenförmig	columnar	MacExcel, Wijcik		1	
	ramified	ramifié	verzweigt	ramificado	Elstar, Golden Delicious		2	
<b>3. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(a)</b>	<b>00</b>			
	<b><u>Only varieties with Tree type: ramified:</u> Tree: habit</b>	<b><u>Seulement les variétés avec Type d'arbre : ramifié : Arbre : port</u></b>	<b><u>Nur Sorten mit Baumtyp: verzweigt: Baum: Wuchsform</u></b>	<b><u>Solo variedades con Árbol tipo: ramificado: Árbol: hábito</u></b>				
	upright	dressé	aufrecht	erecto	Alkmene, Fresco, Solaris		1	
	upright to spreading	dressé à étalé	aufrecht bis auseinanderfallend	erecto a extendido	Akane, Arkcharm, Harmensz, Katrina, Reka		2	
	spreading	étalé	auseinanderfallend	extendido	Pinova, Redkan, Topaz		3	
	drooping	retombant	herabhängend	colgante	Idared, James Grieve, Pivita		4	
	weeping	pleureur	lang überhängend	llorón	Gerlinde, Nield's Drooper		5	



	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>4.</b>	<b>(*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(b)</b>	<b>00</b>		
		<b>One-year-old shoot: length of internode</b>	<b>Rameau d'un an : longueur des entre-nœuds</b>	<b>Einjähriger Trieb: Internodienlänge</b>	<b>Rama de un año: longitud del entrenudo</b>			
		very short	très courte	sehr kurz	muy corta	MacExcel, Wijcik	1	
		very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta	Alkmene, Coxcolumnar, Tuscan	2	
		short	courte	kurz	corta	Florina	3	
		short to medium	courte à moyenne	kurz bis mittel	corta a media	Ahrista, Margol	4	
		medium	moyenne	mittel	media	Jonagold, Redaphough	5	
		medium to long	moyenne à longue	mittel bis lang	media a larga	Constance, Crowngold, Nicoter, Stela	6	
		long	longue	lang	larga	Auralia	7	
		long to very long	longue à très longue	lang bis sehr lang	larga a muy larga	Angold	8	
		very long	très longue	sehr lang	muy larga	Teser	9	
<b>5.</b>	<b>(*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(b)</b>	<b>00</b>		
		<b>One-year-old shoot: number of lenticels</b>	<b>Rameau d'un an : nombre de lenticelles</b>	<b>Einjähriger Trieb: Anzahl Lentizellen</b>	<b>Rama de un año: número de lenticelas</b>			
		few	petit	gering	bajo	Alkmene, Bramley's Seedling	1	
		medium	moyen	mittel	medio	Cox's Orange Pippin	2	
		many	élevé	groß	alto	Mutsu, SQ 159	3	
<b>6.</b>	<b>(*)</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>		
		<b>Leaf blade: attitude in relation to shoot</b>	<b>Limbe : port par rapport au rameau</b>	<b>Blattspreite: Haltung im Verhältnis zum Trieb</b>	<b>Limbo: porte en relación con la rama</b>			
		upwards	dressé	aufwärts gerichtet	ascendente	Delblush, Elstar, Fresco, Redkan, Santana	1	
		upwards to outwards	dressé à perpendiculaire	aufwärts gerichtet bis abstehend	ascendente a hacia el exterior	Jugala, PremA153, Resista, Sweet Lady	2	
		outwards	perpendiculaire	abstehend	hacia el exterior	Cripps Pink, Jonagold, Pinova, Pomforyou, Schone van Boskoop	3	
		downwards	retombant	abwärts gerichtet	hacia abajo	Fuji BC, Himekami, Rewena	4	

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>7. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf blade: length</b>	<b>Limbe : longueur</b>	<b>Blattspreite: Länge</b>	<b>Limbo: longitud</b>				
	very short	très courte	sehr kurz	muy corta	Mars, Reanda			1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta	Coxcolumnar, Goldstar			2
	short	courte	kurz	corta	Ariwa, Gusto			3
	short to medium	courte à moyenne	kurz bis mittel	corta a media	Braeburn, Fuji BC, Topaz			4
	medium	moyenne	mittel	media	Cripps Red, Dalili, Elstar			5
	medium to long	moyenne à longue	mittel bis lang	media a larga	Jonagold, Pinova, Santana			6
	long	longue	lang	larga	Fresco, Minnewashta, Monidel			7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga	Pomforyou, Pompink			8
	very long	très longue	sehr lang	muy larga	Northpole, Telamon			9
<b>8. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf blade: width</b>	<b>Limbe : largeur</b>	<b>Blattspreite: Breite</b>	<b>Limbo: anchura</b>				
	very narrow	très étroite	sehr schmal	muy estrecha	Coxdwarf			1
	very narrow to narrow	très étroite à étroite	sehr schmal bis schmal	muy estrecha a estrecha	Cox La Vera, Dalinco			2
	narrow	étroite	schmal	estrecha	Braeburn, La Flamboyante			3
	narrow to medium	étroite à moyenne	schmal bis mittel	estrecha a media	Dalili, Dalinbel, Elstar, Topaz			4
	medium	moyenne	mittel	media	Cripps Red, Nicoter, Pinova, Santana			5
	medium to broad	moyenne à large	mittel bis breit	media a ancha	Cripps Pink, Jonagold, Rubinola, Zari			6
	broad	large	breit	ancha	Jonagored, Rubinstep			7
	broad to very broad	large à très large	breit bis sehr breit	ancha a muy ancha	Pomforyou			8
	very broad	très large	sehr breit	muy ancha	Charlotte, Northpole			9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>9. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf blade: ratio length/width</b>	<b>Limbe : rapport longueur/largeur</b>	<b>Blattspreite: Verhältnis Länge/Breite</b>	<b>Limbo: relación longitud/anchura</b>				
	very low	très bas	sehr klein	muy baja				1
	very low to low	très bas à bas	sehr klein bis klein	muy baja a baja	Reanda			2
	low	bas	klein	baja	Goldstar			3
	low to medium	bas à moyen	klein bis mittel	baja a media	Bay 3484, Rubinola			4
	medium	moyen	mittel	media	Cripps Pink, Rafzubin, Santana			5
	medium to high	moyen à élevé	mittel bis groß	media a alta	Braeburn, Cripps Red, Elstar, Pinova			6
	high	élevé	groß	alta	Fiesta, Minnewashta			7
	high to very high	élevé à très élevé	groß bis sehr groß	alta a muy alta	Civni, Monidel			8
	very high	très élevé	sehr groß	muy alta	Dalincó, Telamon			9
<b>10.</b>	<b>PQ</b>	<b>VG</b>	<b>(c)</b>	<b>75/77</b>				
	<b>Leaf blade: color</b>	<b>Limbe : couleur</b>	<b>Blattspreite: Farbe</b>	<b>Limbo: color</b>				
	light green	vert clair	hellgrün	verde claro				1
	light to medium green	vert clair à moyen	hell- bis mittelgrün	verde claro a medio	Maribelle			2
	medium green	vert moyen	mittelgrün	verde medio	Civni, Cripps Pink, Ecolette			3
	medium to dark green	vert moyen à foncé	mittel- bis dunkelgrün	verde medio a oscuro	Braeburn, Karmijn de Sonnaville, La Flamboyante, Pomforyou			4
	dark green	vert foncé	dunkelgrün	verde oscuro				5
	light purple red	rouge-pourpre clair	hellpurpurrot	rojo púrpura claro				6
	medium purple red	rouge-pourpre moyen	mittelpurpurrot	rojo púrpura medio				7
	dark purple red	rouge-pourpre foncé	dunkelpurpurrot	rojo púrpura oscuro	Luresweet, R201			8
<b>11.</b>	<b>QN</b>	<b>VG</b>	<b>(c)</b>	<b>75/77</b>				
	<b>Leaf blade: glossiness</b>	<b>Limbe : brillance</b>	<b>Blattspreite: Glanz</b>	<b>Limbo: brillo</b>				
	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Blahova Libovice, Solaris			1
	medium	moyenne	mittel	medio	Elstar, Falstaff			2
	strong	forte	stark	fuerte	Elise, Fresco, Idared			3
<b>12. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf blade: incisions of margin</b>	<b>Limbe : incisions du bord</b>	<b>Blattspreite: Randeinschnitte</b>	<b>Limbo: incisiones del borde</b>				
	crenate	crénelées	gekerbt	crenadas	Braeburn, Pinova, Santana			1
	crenate to serrate	crénelées à dentelées	gekerbt bis gesägt	crenadas a serradas	Ecolette, Elstar, Tenroy			2
	serrate	dentelées	gesägt	serradas	Fuji, Jonagold, Mutsu			3

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>13.</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf blade: shape in cross section</b>	<b>Limbe : forme en section transversale</b>	<b>Blattspreite: Form im Querschnitt</b>	<b>Limbo: forma en sección transversal</b>				
	v-shaped	en forme de V	v-förmig	en forma de v	Frureru			1
	concave	concave	konkav	cóncava	Alkmene, Clivia, Gloster, Piros			2
	flat with reflexed margins	plate, avec des bords réfléchis	flach mit gebogenen Rändern	plana con bordes reflejados	Rambour d'Hiver			3
	flat	plate	flach	plana	Bittenfelder Sämling, Minnewashta			4
	convex	convexe	konvex	convexa	Collina, Vicking			5
<b>14. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Petiole: length</b>	<b>Pétiole : longueur</b>	<b>Blattstiel: Länge</b>	<b>Pecíolo: longitud</b>				
	very short	très courte	sehr kurz	muy corta				1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta	Jonagold			2
	short	courte	kurz	corta	Delgollune, Jonagored			3
	short to medium	courte à moyenne	kurz bis mittel	corta a media	Bay 3484, Dalinbel			4
	medium	moyenne	mittel	media	Cripps Pink, Ecolette, Nicoter, Pinova, Topaz			5
	medium to long	moyenne à longue	mittel bis lang	media a larga	Civni, Cripps Red, Elstar			6
	long	longue	lang	larga	Resista			7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga	Pomforyou, Trajan			8
	very long	très longue	sehr lang	muy larga	Northpole, Pompink			9
<b>15.</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(c)</b>	<b>75/77</b>			
	<b>Leaf: ratio length of leaf blade/length of petiole</b>	<b>Feuille : rapport longueur du limbe/longueur du pétiole</b>	<b>Blatt: Verhältnis Länge der Blattspreite/Länge des Blattstiels</b>	<b>Hoja: relación longitud del limbo/longitud del pecíolo</b>				
	very low	très bas	sehr klein	muy baja				1
	low	bas	klein	baja				2
	medium	moyen	mittel	media				3
	high	élevé	groß	alta				4
	very high	très élevé	sehr groß	muy alta				5

	English		français		deutsch		español		Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>16.</b>	<b>QN</b>	<b>VG</b>	<b>(c)</b>		<b>75/77</b>					
	<b>Petiole: extent of anthocyanin coloration from base</b>	<b>Pétirole : étendue de la pigmentation anthocyanique depuis la base</b>	<b>Blattstiel: Ausdehnung der Anthocyanfärbung von der Basis aus</b>		<b>Pecíolo: extensión de la pigmentación antocianica desde la base</b>					
	absent or very small	absente ou très petite	fehlend oder sehr klein		ausente o muy pequeña		Befresh			1
	small	petite	klein		pequeña		Civni, Cripps Red, Jonagold			2
	medium	moyenne	mittel		media		Braeburn, Dalinbel, Pilot			3
	large	grande	groß		grande		Pomforyou, Scired			4
	very large	très grande à très grande	sehr groß		muy grande		Bay 3484			5
<b>17. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(d)</b>	<b>60/65</b>					
	<b>Flower: diameter</b>	<b>Fleur : diamètre</b>	<b>Blüte: Durchmesser</b>		<b>Flor: diámetro</b>					
	very small	très petit	sehr klein		muy pequeño		Spätblühender Taffetapfel			1
	small	petit	klein		pequeño		Pia, Pingo			2
	medium	moyen	mittel		medio		Civni, Elstar, Pinova			3
	large	grand	groß		grande		Delcorf, Rafzubin, Zari			4
	very large	très grand	sehr groß		muy grande		Astramel			5
<b>18.</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(d)</b>	<b>60/65</b>					
	<b>Flower: position of stigmas relative to anthers</b>	<b>Fleur : position des stigmates par rapport aux anthères</b>	<b>Blüte: Stellung der Narben im Vergleich zu den Antheren</b>		<b>Flor: posición de los estigmas en relación con las anteras</b>					
	below	au-dessous	unterhalb		por debajo		Bay 3484, Braeburn, Pomforyou, Topaz			1
	same level	même niveau	auf gleicher Höhe		al mismo nivel		Cripps Pink, Ecolette, Pinova, Santana			2
	above	au-dessus	oberhalb		por encima		Civni, Elstar, Nicoter, Rafzubin			3
<b>19.</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(d)</b>	<b>67/69</b>					
	<b>Flower: intensity of anthocyanin coloration at base of filament</b>	<b>Fleur : intensité de la pigmentation anthocyanique à la base du filament</b>	<b>Blüte: Intensität der Anthocyanfärbung an der Basis des Staubfadens</b>		<b>Flor: intensidad de la pigmentación antocianica en la base del filamento</b>					
	absent or very weak	absente ou très faible	fehlend oder sehr gering		ausente o muy débil		Braeburn, Cripps Pink, Karneval, Minnewashta			1
	weak	faible	gering		débil		Bruggers Festivale, Dalinbel, Red Jonaprince			2
	medium	moyenne	mittel		media		Elstar			3
	strong	forte	stark		fuerte		Weirouge			4
	very strong	très forte	sehr stark		muy fuerte		Luregust			5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>20. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(d)</b>	<b>60/65</b>			
	<b>Flower: arrangement of petals</b>	<b>Fleur : disposition des pétales</b>	<b>Blüte: Anordnung der Blütenblätter</b>	<b>Flor: disposición de los pétalos</b>				
	free	disjoints	freistehend	libre	Braeburn, Nicoter, Scifresh			1
	intermediate	intermédiaire	intermediär	intermedia	Civni, Elstar, Pinova, Topaz			2
	overlapping	se recouvrant	überlappend	solapada	Cripps Red, Pomforyou, Šampion			3
<b>21.</b>	<b>QN</b>	<b>VG</b>	<b>(e), (f)</b>	<b>73/74</b>				
	<b>Young fruit: relative area of over color</b>	<b>Jeune fruit : surface relative de la couleur du lavis</b>	<b>Junge Frucht: Anteil der Deckfarbe</b>	<b>Fruto joven: zona relativa del color superficial</b>				
	absent or very small	absente ou très petite	fehlend oder sehr gering	ausente o muy pequeña	Norhey			1
	very small to small	très petite à petite	sehr gering bis gering	muy pequeña a pequeña	Nicogreen			2
	small	petite	gering	pequeña	Cripps Pink, Delcorf, Nicoter			3
	small to medium	petite à moyenne	gering bis mittel	pequeña a media	Braeburn, Tenroy, Topaz			4
	medium	moyenne	mittel	media	Elstar, Golden Delicious			5
	medium to large	moyenne à grande	mittel bis hoch	media a grande	Pinova, Solaris			6
	large	grande	hoch	grande	Delblush, Rafzubin			7
	large to very large	grande à très grande	hoch bis sehr hoch	grande a muy grande	Jolana			8
	very large	très grande	sehr hoch	muy grande	Bay 3484, Luregust			9
<b>22. (*)</b>	<b>QN</b>	<b>MG</b>	<b>(g)</b>	<b>89</b>				
	<b>Fruit: weight</b>	<b>Fruit : poids</b>	<b>Frucht: Gewicht</b>	<b>Fruto: peso</b>				
	very low	très faible	sehr niedrig	muy bajo	Api Noir			1
	very low to low	très faible à faible	sehr niedrig bis niedrig	muy bajo a bajo	Norhey			2
	low	faible	niedrig	bajo	Heco, Trajan			3
	low to medium	faible à moyen	niedrig bis mittel	bajo a medio	Bay 3484, Pomforyou			4
	medium	moyenne	mittel	medio	Cripps Pink, Elstar, Pinova, Topaz			5
	high	élevé	hoch	alto	Golden Delicious, Santana			6
	medium to high	moyen à élevé	mittel bis hoch	medio a alto	Jonagold, Nicoter			7
	high to very high	élevé à très élevé	hoch bis sehr hoch	alto a muy alto	Nicogreen			8
	very high	très élevé	sehr hoch	muy alto	Howgate Wonder, Pisaxa			9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>23. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>			
	<b>Fruit: height</b>	<b>Fruit : hauteur</b>	<b>Frucht: Höhe</b>	<b>Fruto: altura</b>				
	very short	très courte	sehr niedrig	muy baja	Norhey		1	
	very short to short	très courte à courte	sehr niedrig bis niedrig	muy baja a baja	Heco		2	
	short	courte	niedrig	baja	Trajan		3	
	short to medium	courte à moyenne	niedrig bis mittel	baja a media	Elstar, Pomforyou, Topaz		4	
	medium	moyenne	mittel	media	Bay 3484, La Flamboyante, Santana		5	
	medium to tall	moyenne à haute	mittel bis hoch	media a alta	Cripps Pink, Pinova, Šampion		6	
	tall	haute	hoch	alta	Golden Delicious, Jonagold		7	
	tall to very tall	haute à très haute	hoch bis sehr hoch	alta a muy alta	Pisaxa		8	
	very tall	très haute	sehr hoch	muy alta	Befresh		9	
<b>24. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>			
	<b>Fruit: diameter</b>	<b>Fruit : diamètre</b>	<b>Frucht: Durchmesser</b>	<b>Fruto: diámetro</b>				
	very small	très petit	sehr klein	muy pequeño	Nela, Scarlet Surprise, Summerred		1	
	very small to small	très petit à petit	sehr klein bis klein	muy pequeño a pequeño	Heco		2	
	small	petit	klein	pequeño			3	
	small to medium	petit à moyen	klein bis mittel	pequeño a medio	Cox's Orange Pippin, Cripps Pink, Dalili, Pomforyou		4	
	medium	moyen	mittel	medio	Elstar, Pinova, Topaz		5	
	medium to large	moyen à grand	mittel bis groß	medio a grande	Braeburn, Nicoter		6	
	large	grand	groß	grande	Dalinbel, Jonagold		7	
	large to very large	grand à très grand	groß bis sehr groß	grande a muy grande	Befresh, Ontario		8	
	very large	très grand	sehr groß	muy grande	Bramley's Seedling		9	

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>25. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>			
	<b>Fruit: ratio height/diameter</b>	<b>Fruit : rapport hauteur/diamètre</b>	<b>Frucht: Verhältnis Höhe/Durchmesser</b>	<b>Fruto: relación altura/diámetro</b>				
	very low	très bas	sehr klein	muy baja				1
	very low to low	très bas à bas	sehr klein bis klein	muy baja a baja	Brettacher, Ingol			2
	low	bas	klein	baja	Auralia, Harmensz			3
	low to medium	bas à moyen	klein bis mittel	baja a media	Dalinbel, Elstar, Karmijn de Sonnaville			4
	medium	moyen	mittel	media	Ecolette, Fuji BC, Pomforyou, Santana			5
	medium to high	moyen à élevé	mittel bis groß	media a alta	Civni, Jonagold, Rafzubin			6
	high	élevé	groß	alta	Braeburn, Golden Delicious, Pinova			7
	high to very high	élevé à très élevé	groß bis sehr groß	alta a muy alta	Cripps Pink, Dalili			8
	very high	très élevé	sehr groß	muy alta	Rewena, Saturn			9
<b>26. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>			
	<b>Fruit: shape</b>	<b>Fruit : forme</b>	<b>Frucht: Form</b>	<b>Fruto: forma</b>				
	flat globose conical	conique globuleuse plate	flach kugel-kegelförmig	plana globosa cónica	Melrose			1
	oblate	arrondie-aplatie	breitrund	achatada	Bramley's Seedling, Lipno			2
	circular	circulaire	kreisförmig	circular	Dalinbel, Rubinola, Topaz			3
	elliptic	elliptique	elliptisch	elíptica	Fuji BC, Minnewashta			4
	square	équilatérale	quadratisch	cuadrada	Bonita			5
	oblong	oblongue	rechteckig	oblonga	Čadel , Renora			6
	ovate	ovale	eiförmig	oval	Cripps Pink, Delcorf			7
	conical	conique	kegelförmig	cónica	Civni, Elstar, Nicoter, Pinova, Rafzubin			8
	conical waisted	conique rétrécie	tailliert kegelförmig	cónica entallada	Gloster, Redkan			9
	obconical	obconique	verkehrt kegelförmig	obcónica	Empire			10
<b>27.</b>	<b>QN</b>	<b>VG</b>		<b>(g)</b>	<b>89</b>			
	<b>Fruit: ribbing</b>	<b>Fruit : côtes</b>	<b>Frucht: Rippung</b>	<b>Fruto: acostillado</b>				
	absent or weak	absentes ou faibles	fehlend oder gering	ausente o débil	Elstar, Harmensz, Pinova, Scifresh, SQ 159			1
	medium	moyennes	mittel	medio	Cripps Pink, Dalili, Pilot, Santana			2
	strong	fortes	stark	fuerte	Redkan			3



	English		français		deutsch		español		Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>28.</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>		<b>89</b>					
	<b>Fruit: crowning at calyx end</b>		<b>Fruit : couronnement au sommet du calice</b>		<b>Frucht: Krönung am Kelchende</b>		<b>Fruto: coronado del extremo del cáliz</b>			
	absent or weak		absent ou faible		fehlend oder gering		ausente o débil		Elstar, Fresco, Heco, Schone van Boskoop	1
	medium		moyen		mittel		medio		Luregust, Pinova, Santana, Scifresh, Topaz	2
	strong		fort		stark		fuerte		Redkan	3
<b>29. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>					
	<b>Fruit: ground color</b>		<b>Fruit : couleur de fond</b>		<b>Frucht: Grundfarbe</b>		<b>Fruto: color de fondo</b>			
	not visible		non visible		nicht sichtbar		no visible		Bay 3484, Lurefresh, Luregust, Red Jonaprince	1
	whitish yellow		jaune blanchâtre		weißlichgelb		amarillo blanquecino		Heco	2
	yellow		jaune		gelb		amarillo		Rea Gold, Scifresh, Solaris	3
	whitish green		vert blanchâtre		weißlichgrün		verde blanquecino		Fuji BC, MC 38, Pomforyou, Pompink	4
	yellow green		vert jaune		gelbgrün		verde amarillento		Jonagold, Pia, Suntan	5
	green		vert		grün		verde		Canada gris, Granny Smith, Ontario, Tuscan	6
<b>30. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(f, g)</b>	<b>89</b>					
	<b>Fruit: hue of over color</b>		<b>Fruit : teinte du lavis</b>		<b>Frucht: Ton der Deckfarbe</b>		<b>Fruto: tono del color superficial</b>			
	orange red		rouge orangé		orangerot		rojo anaranjado		Goldstar, Rea Gold, Solaris	1
	pink red		rouge-rose		rosarot		rojo rosado		Cripps Pink, Delorgue	2
	red		rouge		rot		rojo		Pinova, Prima, Red Elstar, Tenroy	3
	purple red		rouge-pourpre		purpurrot		rojo púrpura		Bay 3484, Luresweet, MC 38, Spartan	4
	brown red		rouge-brun		braunrot		rojo amarronado		Braeburn, Fiesta, Fresco, Fuji BC, Suntan	5

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>31. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(+)</b>	<b>(f), (g)</b>	<b>89</b>			
	<b>Fruit: intensity of over color</b>	<b>Fruit : intensité du lavis</b>	<b>Frucht: Intensität der Deckfarbe</b>	<b>Fruto: intensidad del color superficial</b>				
	very light	très claire	sehr hell	muy clara	Alexis			1
	very light to light	très claire à claire	sehr hell bis hell	muy clara a clara	Golden Delicious, Solaris			2
	light	claire	hell	clara	Tenroy, Tuscan			3
	light to medium	claire à moyenne	hell bis mittel	clara a media	Elstar, Monidel, Rafzubin			4
	medium	moyenne	mittel	media	Cripps Pink, Pia, Pilot, Remo			5
	medium to dark	moyenne à foncée	mittel bis dunkel	media a oscura	Fiesta, James Grieve, Jonagold, Suntan			6
	dark	foncée	dunkel	oscura	Elise, Jonagored, Lurefresh, Scired			7
	dark to very dark	foncée à très foncée	dunkel bis sehr dunkel	oscura a muy oscura	Bay 3484, Obelisk, Red Jonaprince, Redkan			8
	very dark	très foncée	sehr dunkel	muy oscura	CIV 323, CIVG198			9
<b>32. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(f), (g)</b>	<b>89</b>				
	<b>Fruit: relative area of over color</b>	<b>Fruit : surface relative du lavis</b>	<b>Frucht: Anteil der Deckfarbe</b>	<b>Fruto: zona relativa del color superficial</b>				
	absent or very small	absente ou très petite	fehlend oder sehr gering	ausente o muy pequeña	Granny Smith, Tuscan			1
	very small to small	très petite à petite	sehr gering bis gering	muy pequeña a pequeña	Golden Delicious			2
	small	petite	gering	pequeña	Auralia, Cox's Orange Pippin, Goldstar, Solaris			3
	small to medium	petite à moyenne	gering bis mittel	pequeña a media	Charlotte, Schone van Boskoop			4
	medium	moyenne	mittel	media	Dalili, Elstar, Minnewashta, Rea Gold			5
	medium to large	moyenne à grande	mittel bis groß	media a grande	Heco, Pia, Rafzubin			6
	large	grande	groß	grande	Fiesta, Santana, Suntan, Tenroy			7
	large to very large	grande à très grande	groß bis sehr groß	grande a muy grande	Mars, Rosy Glow, SQ 159			8
	very large	très grande	sehr groß	muy grande	Bay 3484, MC 38, Red Jonaprince, Redkan			9

	English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>33. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>(f), (g)</b>	<b>89</b>			
	<b>Fruit: pattern of over color</b>	<b>Fruit : répartition du lavis</b>	<b>Frucht: Muster der Deckfarbe</b>	<b>Fruto: forma de disposición</b>				
	only solid flush	seulement surteinte solide	nur ganzflächig	de manera puramente uniforme	Bay 3484, Red Jonaprince, Telamon		1	
	solid flush with stripes	surteinte solide avec des raies	ganzflächig mit Streifen	uniforme con rayas	Bruggers Festivale, Charlotte, Cripps Pink, Dalili, James Grieve Esselborn, Pingo		2	
	only stripes	raies seulement	nur Streifen	sólo rayas	Dülmener Rosenapfel		3	
	flushed and mottled	surteinte et tachetée	geflammt und gepunktet	uniforme y jaspeada	Dalinbel, Scifresh		4	
	flushed, striped and mottled	surteinte, striée et tachetée	geflammt, gestreift und gesprenkelt	uniforme, rayada y jaspeada	Elstar, Pinova, Rafzubin, Topaz		5	
	marbled	marbrée	marmoriert	veteada	Karneval		6	
<b>34.</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>				
	<b>Fruit: conspicuousness of stripes</b>	<b>Fruit : netteté des raies</b>	<b>Frucht: Ausprägung der Streifen</b>	<b>Fruto: visibilidad de las rayas</b>				
	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Eden		1	
	medium	moyenne	mittel	media	Tenroy		2	
	strong	forte	stark	fuerte	Caudle		3	
<b>35. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>				
	<b>Fruit: area of russet around stalk attachment</b>	<b>Fruit : surface de liège autour du pédoncule</b>	<b>Frucht: Fläche der Berostung im Bereich des Stielansatzes</b>	<b>Fruto: zona de russeting en torno a la base peduncular</b>				
	absent or small	absente ou petite	fehlend oder klein	ausente o pequeña	Dalili, Jonagold, Pinova, Tuscan		1	
	medium	moyenne	mittel	media	Charlotte, Nela, Pilot, Prima		2	
	large	grande	groß	grande	Elstar, Holsteiner Cox, Schone van Boskoop, Suntan		3	
<b>36.</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>				
	<b>Fruit: area of russet on cheeks</b>	<b>Fruit : surface de liège sur les joues</b>	<b>Frucht: Fläche der Berostung auf den Wangen</b>	<b>Fruto: zona de russeting de las caras</b>				
	absent or small	absente ou petite	fehlend oder klein	ausente o pequeña	Gala, Jonagold, Monidel, Obelisk, Pia, Pilot		1	
	medium	moyenne	mittel	media	Lurefresh, Schone van Boskoop, Suntan		2	
	large	grande	groß	grande	Canada gris, Egremont Russet, Zabergäurennette		3	

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>37. (*)</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>		
	<b>Fruit: area of russet around eye basin</b>	<b>Fruit : surface de liège autour de la cuvette de l'œil</b>	<b>Frucht: Fläche der Berostung im Bereich der Kelchgrube</b>	<b>Fruto: zona de russetting de la cavidad del ojo</b>		
	absent or small	absente ou petite	fehlend oder klein	ausente o pequeña	Gala, Jonagold, Pinova, Prima	1
	medium	moyenne	mittel	media	Elstar, Holsteiner Cox	2
	large	grande	groß	grande	Egremont Russet, Fresco, Schone van Boskoop, Suntan	3
<b>38.</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: number of lenticels</b>	<b>Fruit : nombre de lenticelles</b>	<b>Frucht: Anzahl Lentizellen</b>	<b>Fruto: número de lenticelas</b>		
	very few	très petit	sehr gering	muy bajo		1
	few	petit	gering	bajo	Coxcolumnar, Rewena	2
	medium	moyen	mittel	medio	Elstar, Pia, Pinova, Redkan, Tenroy	3
	many	élevé	groß	alto	Dalili, Honeycrisp, Jonagored, Scifresh	4
	very many	très élevé	sehr groß	muy alto a muy alto	Hidden Rose	5
<b>39. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: length of stalk</b>	<b>Fruit : longueur du pédoncule</b>	<b>Frucht: Länge des Stiels</b>	<b>Fruto: longitud del pedúnculo</b>		
	very short	très courte	sehr kurz	muy corta		1
	short	courte	kurz	corta	Holsteiner Cox, Minnewashta, Telamon, Trajan, Tuscan	2
	medium	moyenne	mittel	media	Bay 3484, Lurefresh, Nicoter	3
	long	longue	lang	larga	Elise, Pinova, Rafzubin, Tenroy	4
	very long	très longue	sehr lang	muy larga	Rewena	5
<b>40. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: depth of stalk cavity</b>	<b>Fruit : profondeur de la cavité du pédoncule</b>	<b>Frucht: Tiefe der Stielgrube</b>	<b>Fruto: profundidad de la cavidad peduncular</b>		
	very shallow	très peu profonde	sehr flach	muy poco profunda		1
	shallow	peu profonde	flach	poco profunda	Pomfit, Pompink, Rafzubin, Suntan, Trajan	2
	medium	moyenne	mittel	media	Dalili, Elstar, Fiesta, Topaz	3
	deep	profonde	tief	profunda	Jonagold, MC 38, Rosy Glow	4
	very deep	très profonde	sehr tief	muy profunda		5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>41.</b>	<b>QN</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>		
	<b>Fruit: calyx eye</b>	<b>Fruit : œil du calice</b>	<b>Frucht: Kelch</b>	<b>Fruto: ojo de cáliz</b>		
	closed	fermé	geschlossen	cerrado		1
	partially open	partiellement ouvert	teilweise offen	parcialmente abierto		2
	fully open	entièrement ouvert	vollständig offen	completamente abierto		3
<b>42. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: depth of eye basin</b>	<b>Fruit : profondeur de la cuvette de l'œil</b>	<b>Frucht: Tiefe der Kelchgrube</b>	<b>Fruto: profundidad de la cavidad del ojo</b>		
	very shallow	très peu profond	sehr flach	muy poco profunda		1
	shallow	peu profond	flach	poco profunda	Braeburn, Lurefresh	2
	medium	moyenne	mittel	media	Obelisk, Pinova, Scifresh, Topaz	3
	deep	profond	tief	profunda	Dalili, Elstar, Jonagold	4
	very deep	très profond	sehr tief	muy profunda	MC 38	5
<b>43. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: width of eye basin</b>	<b>Fruit : largeur de la cuvette de l'œil</b>	<b>Frucht: Breite der Kelchgrube</b>	<b>Fruto: anchura de la cavidad del ojo</b>		
	very narrow	très étroite	sehr schmal	muy estrecha		1
	narrow	étroite	schmal	estrecha	SQ 159	2
	medium	moyenne	mittel	media	Braeburn, Elstar, Minnewashta, Pia, Tenroy	3
	broad	large	breit	ancha	Bruggers Festivale, Dalili, Dalinbel, Obelisk	4
	very broad	très large	sehr breit	muy ancha	Solaris	5
<b>44. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>(g)</b>	<b>89</b>	
	<b>Fruit: firmness of flesh</b>	<b>Fruit : fermeté de la chair</b>	<b>Frucht: Festigkeit des Fleisches</b>	<b>Fruto: firmeza de la pulpa</b>		
	very soft	très molle	sehr weich	muy blanda	Transparent de Croncels	1
	soft	molle	weich	blanda	Bay 3484, Pia, Pingo, Piros, Tuscan	2
	medium	moyenne	mittel	media	Obelisk, Red Fuji, Santana, Schone van Boskoop, Topaz	3
	firm	ferme	fest	firme	Braeburn, Pilot	4
	very firm	très ferme	sehr fest	muy firme	LB4852	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>45. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>		
	<b>Fruit: main color of flesh</b>	<b>Fruit : couleur principale de la chair</b>	<b>Frucht: Hauptfarbe des Fleisches</b>	<b>Fruto: color principal de la pulpa</b>		
	white	blanc	weiß	blanco	Akane, Minnewashta, Pia, Spartan	1
	greenish	verdâtre	grünlich	verdoso	Angold, Gloster, Granny Smith, Northpole, Telamon	2
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Elstar, Jonagold, Pinova, Rafzubin	3
	yellowish	jaunâtre	gelblich	amarillento	Coxcolumnar, Pisaxa, Topaz, Zari	4
	orangish	orangée	blassorange	anaranjado	Ladina, Transcendent Crab	5
	pinkish	rosâtre	blassrosa	rosado	Pomfit	6
	reddish	rougeâtre	rötlich	rojizo	Bay 3484, Lureprec	7
<b>46. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(g)</b>	<b>89</b>		
	<b>Fruit: secondary color of flesh</b>	<b>Fruit : couleur secondaire de la chair</b>	<b>Frucht: Sekundärfarbe des Fleisches</b>	<b>Fruto: color secundario de la pulpa</b>		
	none	aucune	keine	ninguno	Gloster, Pinova, Zari	1
	white	blanc	weiß	blanco	Luresweet, Pomfital 1	2
	greenish	verdâtre	grünlich	verdoso		3
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Bay 4584, Lureprec, Weirouge	4
	yellowish	jaunâtre	gelblich	amarillento	Y101	5
	orangish	orangée	blassorange	anaranjado		6
	pinkish	rosâtre	blassrosa	rosado	Tiara, Y102	7
	reddish	rougeâtre	rötlich	rojizo		8
<b>47.</b>	<b>QN</b>	<b>VG</b>		<b>89</b>		
	<b><u>Only varieties with secondary color present:</u> Fruit: extent of secondary color</b>	<b><u>Seulement des variétés avec couleurs secondaire présente :</u> Fruit : étendue de la couleur secondaire</b>	<b><u>Nur Sorten mit vorhandener Sekundärfarbe:</u> Frucht: Ausbreitung der Sekundärfarbe</b>	<b><u>Solo variedades con color secundario presente:</u> Fruto: extensión del color secundario</b>		
	very small	très petite	sehr gering bis gering	muy pequeña		1
	small	petite	gering	pequeña		2
	medium	moyenne	mittel	media	Bay 3484, Y102	3
	large	grande	groß	grande		4
	very large	très grande	sehr groß	muy grande	Luregust	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>48. (*)</b>	<b>PQ</b>	<b>VG</b>	<b>(+)</b>	<b>89</b>		
	<b>Flesh color: distribution of pinkish or reddish coloration</b>	<b>Couleur de la chair : distribution de la coloration rosâtre ou rougeâtre</b>	<b>Fleischfarbe: Verteilung der blassrosanen oder rötlichen Färbung</b>	<b>Color de la pulpa: forma de disposición de la coloración rosada o rojiza</b>		
	none	aucune	keine	ninguno	Gloster, Pinova, Zari	1
	under skin only	sous l'épiderme seulement	nur unter der Haut	sólo bajo la epidermis	Pomfit, Y102	2
	around core only	autour du cœur seulement	nur um den Innenstrunk	sólo alrededor del corazón	R201	3
	under skin and around core	sous l'épiderme et autour du cœur	unter der Haut und um den Innenstrunk	bajo la epidermis y alrededor del corazón	Lureprec	4
	throughout	partout	überall	en la totalidad	Y101	5
<b>49. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>61</b>		
	<b>Time of beginning of flowering</b>	<b>Époque du début de la floraison</b>	<b>Zeitpunkt des Blühbeginns</b>	<b>Época de inicio de la floración</b>		
	very early	très précoce	sehr früh	muy temprana	Anna, Ein-Shemer	1
	very early to early	très précoce à précoce	sehr früh bis früh	muy temprana a temprana	Collina, Delblush, Pompink	2
	early	précoce	früh	temprana	Astramel, Civni, Idared, Topaz	3
	early to medium	précoce à moyenne	früh bis mittel	temprana a media	Cripps Red, Dalili, James Grieve, Jonagored	4
	medium	moyenne	mittel	media	Braeburn, Rafzubin, Tenroy, White Transparent, Zari	5
	medium to late	moyenne à tardive	mittel bis spät	media a tardía	Elise, Gala, Granny Smith, Sansa	6
	late	tardive	spät	tardía	Golden Delicious, Karmijn de Sonnaville, Reine de Reinettes, Sirprize	7
	late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía	Delorina, Suntan	8
	very late	très tardive	sehr spät	muy tardía	Spätblühender Taffetapfel	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>50.</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>87</b>		
	<b>Time for harvest</b>	<b>Époque de la récolte</b>	<b>Zeitpunkt der Pflückreife</b>	<b>Época de la cosecha</b>		
	extremely early	extrêmement précoce	extrem früh	extremadamente temprana	Astramel, Collina, White Transparent	1
	extremely early to very early	extrêmement précoce à très précoce	extrem früh bis sehr früh	extremadamente temprana a muy temprana	Piros	2
	very early	très précoce	sehr früh	muy temprana	Arkcharm, Lena, Minnewashta, Nela	3
	very early to early	très précoce à précoce	sehr früh bis früh	muy temprana a temprana	Bruggers Festivale, Coxcolumnar, Dalili	4
	early	précoce	früh	temprana	Akane, Delorgue, James Grieve, Monidel, Sansa	5
	early to medium	précoce à moyenne	früh bis mittel	temprana a media	Gerlinde, Prima, Santana, Zari	6
	medium	moyenne	mittel	media	Bay 3484, Fiesta, Rubinola	7
	medium to late	moyenne à tardive	mittel bis spät	media a tardía	Civni, Elstar, Karmijn de Sonnaville, Saturn, Suntan, Tenroy	8
	late	tardive	spät	tardía	Jonagold, Pomforyou, Redkan, Sirprize, Telamon	9
	late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía	Florina, Golden Delicious, La Flamboyante, Pinova, Pompink, Topaz	10
	very late	très tardive	sehr spät	muy tardía	Delblush, Delgollune, Fuji BC, Mutsu, Nicoter	11
	very late to extremely late	très tardive à extrêmement tardive	sehr spät bis extrem spät	muy tardía a extremadamente tardía	Braeburn, Fuji	12
	extremely late	extrêmement tardive	extrem spät	extremadamente tarde	Cripps Pink, Cripps Red, Granny Smith, Iduna	13



	English		français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>51. (*)</b>	<b>QN</b>	<b>MG/VG</b>	<b>(+)</b>	<b>89</b>			
	<b>Time of eating maturity</b>	<b>Époque de maturité pour la consommation</b>	<b>Zeitpunkt der Genussreife</b>	<b>Época de madurez para el consumo</b>			
	extremely early	extrêmement précoce	extrem früh	extremadamente temprana	Samo		1
	extremely early to very early	extrêmement précoce à très précoce	extrem früh bis sehr früh	extremadamente temprana a muy temprana	Astramel, Julia		2
	very early	très précoce	sehr früh	muy temprana	Discovery, Helios, Nela		3
	very early to early	très précoce à précoce	sehr früh bis früh	muy temprana a temprana	Bruggers Festivale, Minnewashta		4
	early	précoce	früh	temprana	Alkmene, Gravensteiner, James Grieve, Transparent de Croncels		5
	early to medium	précoce à moyenne	früh bis mittel	temprana a media	Santana		6
	medium	moyenne	mittel	media	Elstar, Gala, Holsteiner Cox, Reine de Reinettes		7
	medium to late	moyenne à tardive	mittel bis spät	media a tardía	Honeycrisp, Karneval, Rubinstep		8
	late	tardive	spät	tardía	Golden Delicious, Jonagold, Pinova, Topaz		9
	late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía	Nicoter, Pilot, Scifresh, Solaris		10
	very late	très tardive	sehr spät	muy tardía	Braeburn, Florina		11
	very late to extremely late	très tardive à extrêmement tardive	sehr spät bis extrem spät	muy tardía a extremadamente tardía	Elise		12
	extremely late	extrêmement tardive	extrem spät	extremadamente tarde	Cripps Pink, Granny Smith		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:

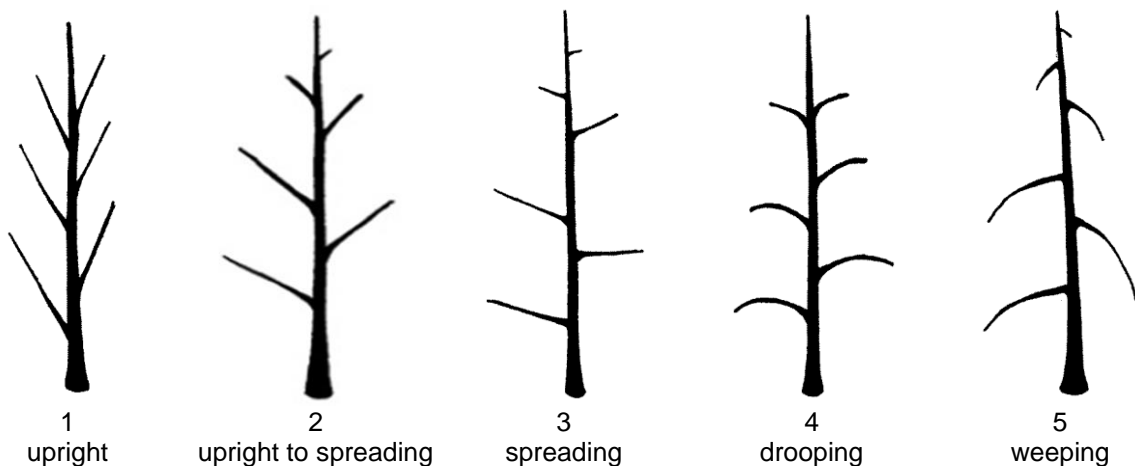
- (a) Observations should be made on bare trees in winter, after at least one significant production of fruit.
- (b) Observations should be made on lateral dormant shoots in winter, on trees that have completed at least one growing season.
- (c) Observations should be made on fully developed leaves from the middle third of vigorous vegetative current season shoot.
- (d) Observations should be made on second or subsequent flowers, at the start of anther dehiscence.
- (e) Observations should be made around 40 days after flowering (stage 65), when the fruit reaches stages 73-74.
- (f) The over color is considered a second color such as a flush which develops over time, covering the ground color of the fruit.
- (g) Observations should be made on fruits when they are eating ripe.

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 1 significant production of fruit. It can either be assessed at the peak of vegetative growth in summer, or during the dormant season before pruning, with reference to shoot length and thickness, and to trunk diameter.

Ad. 3: Only varieties with Tree type: ramified: Tree: habit



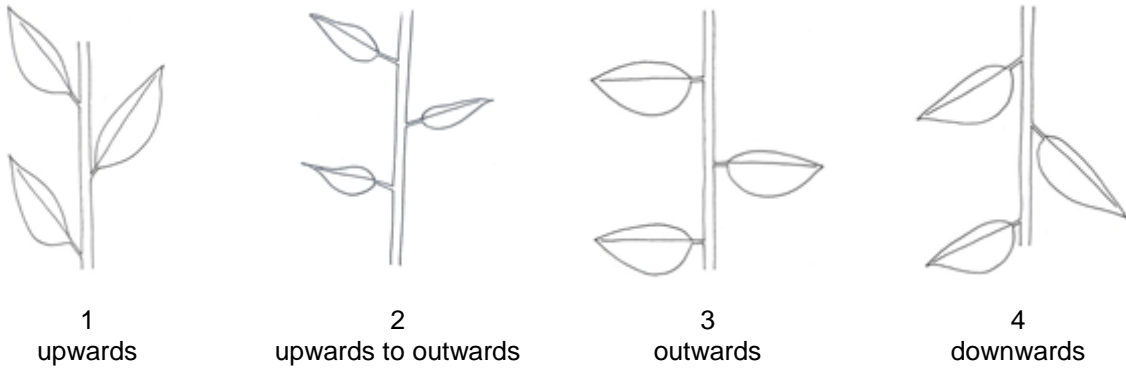
Ad. 4: One-year-old shoot: length of internode

The length of the internode should be observed in the middle third of the shoot. Measurements can be made using a vernier caliper gauge.

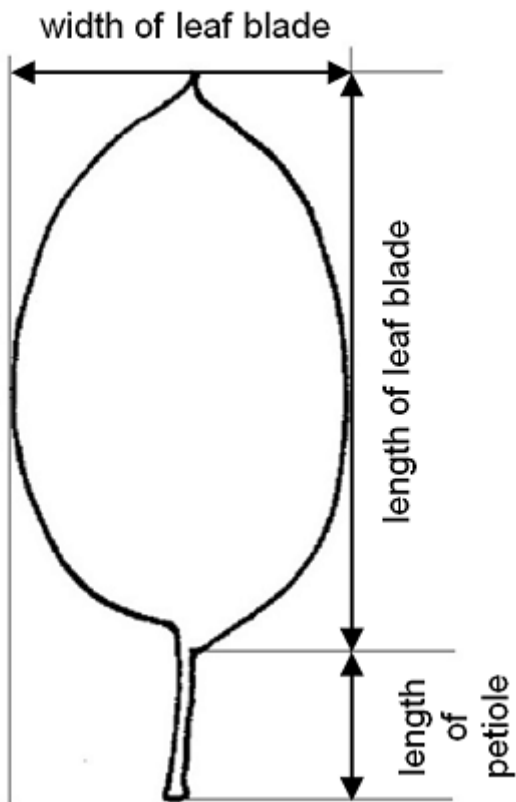
Ad. 5: One-year-old shoot: number of lenticels

The number of lenticels should be assessed at midlength of the shoot, by counting (in a defined area [e.g. a shoot length of 1 cm]) or by visual assessment of the density of lenticels on the bark.

Ad. 6: Leaf blade: attitude in relation to shoot



Ad. 7: Leaf blade: length



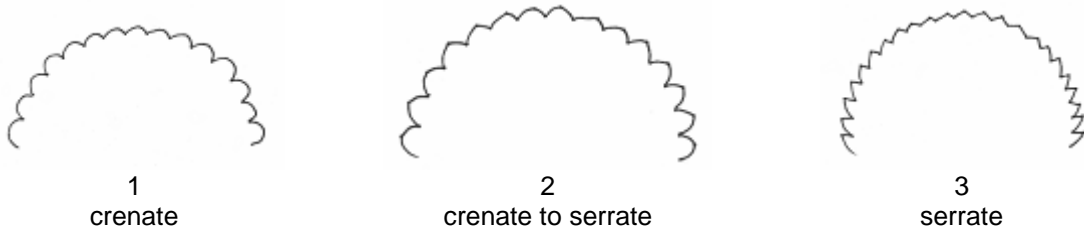
Ad. 8: Leaf blade: width

See Ad. 7

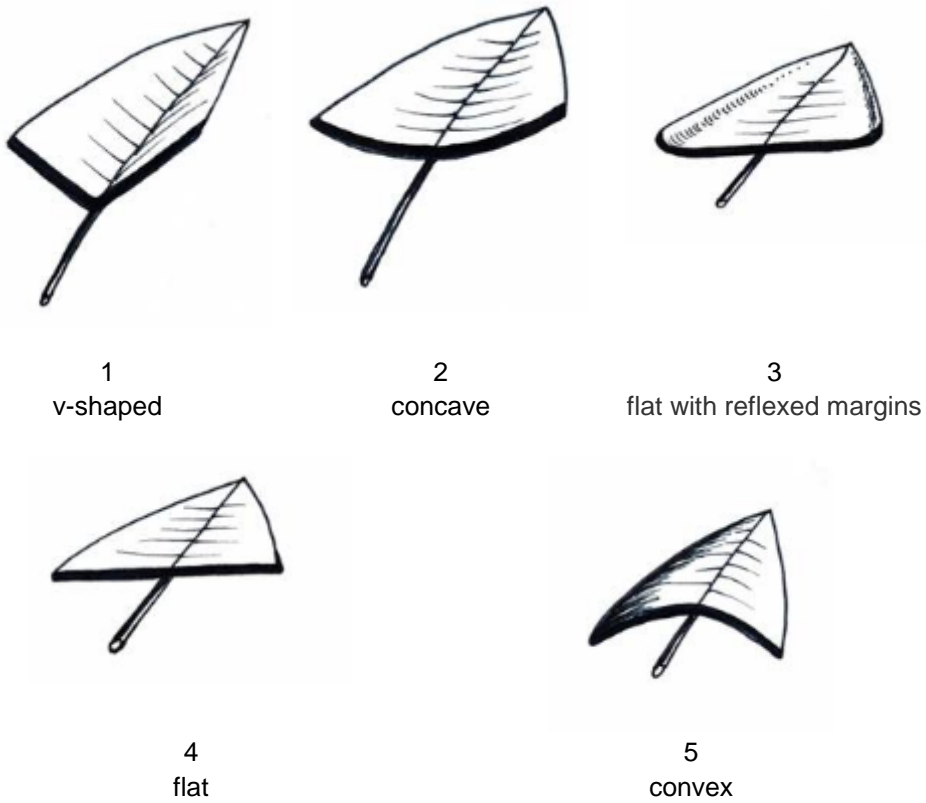
Ad. 9: Leaf blade: ratio length/width

See Ad. 7

Ad. 12: Leaf blade: incisions of margin



Ad. 13: Leaf blade: shape in cross section



Ad. 14: Petiole: length

See Ad. 7

Ad. 15: Leaf: ratio length of leaf blade / length of petiole

See Ad. 7

Ad. 17: Flower: diameter

Observations should be made with petals pressed into horizontal position.

Ad. 18: Flower: position of stigmas relative to anthers



1  
below



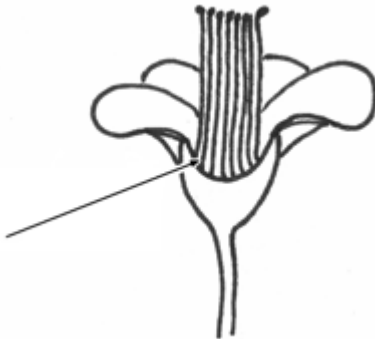
2  
same level



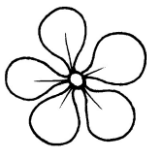
3  
above

Ad. 19: Flower: intensity of anthocyanin coloration at base of filament

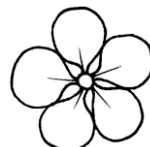
Observations should be made just after petal drop.



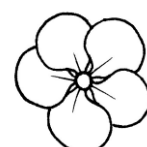
Ad. 20: Flower: arrangement of petals



1  
free



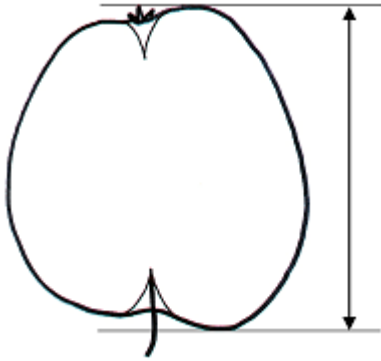
2  
intermediate



3  
overlapping

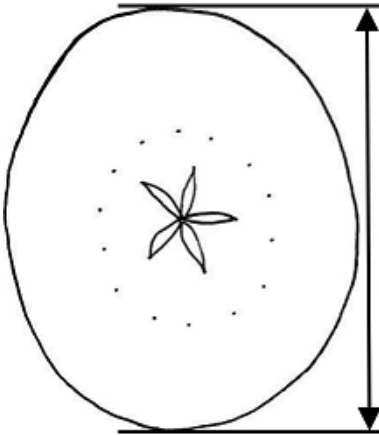
Ad. 23: Fruit: height

The maximum height should be observed.



Ad. 24: Fruit: diameter

The maximum diameter should be observed.

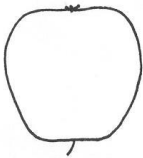
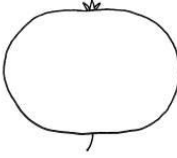
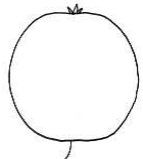
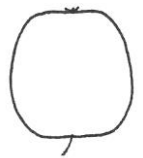

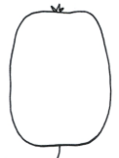
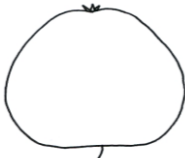


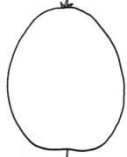


Ad. 25: Fruit: ratio height/diameter

A ratio in the middle of the possible range represents states 1, 5, 8, or 10 of char. 26; values smaller than the middle would result in notes 3 or 9 of char. 26; values larger than the middle would be notes 2, 4, 6 or 7 of char. 26.

Ad. 26: Fruit: shape

See Ad. 25

		← ratio height / diameter →			
		low	medium	high	
broadest part	↑	above middle		 10 obconical	
	↕	at middle	 2 oblate	 3 circular   5 square	 4 elliptic   6 oblong
	↓	below middle	 1 flat globose conical	 9 conical waisted	 8 conical   7 ovate

Ad. 29: Fruit: ground color

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

Ad. 30: Fruit: hue of over color

Observations should be made after removing bloom.

Ad. 31: Fruit: intensity of over color

Fruit: hue of over color	Fruit: intensity of over color								
	very light	very light to light	light	light to medium	medium	medium to dark	dark	dark to very dark	very dark
orange red		Solaris							
pink red					Cripps Pink				
red			Tenroy						
purple red									
brown red						Fiesta, Suntan			

Ad. 33: Fruit: pattern of over color



1  
only solid flush



2  
solid flush with stripes



3  
only stripes



4  
flushed and mottled



5  
flushed, striped and mottled

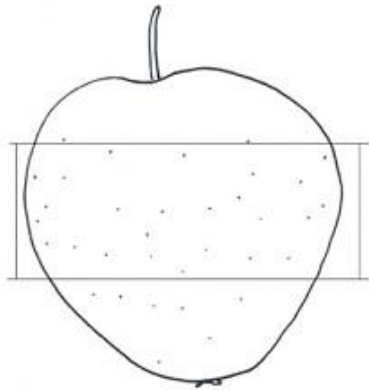


6  
marbled

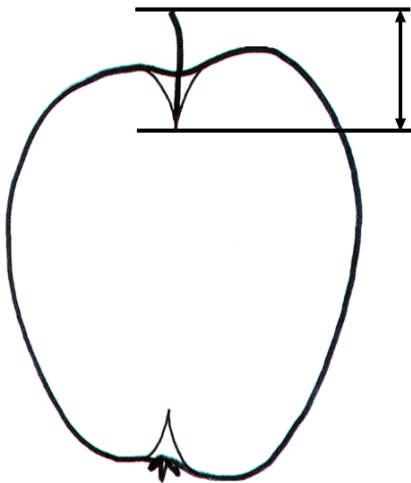


Ad. 38: Fruit: number of lenticels

Observations should be made in the central part of the fruit, by counting (in a defined area [e.g. a window of 1 cm<sup>2</sup>]) or by visual assessment of the density of lenticels on the skin.



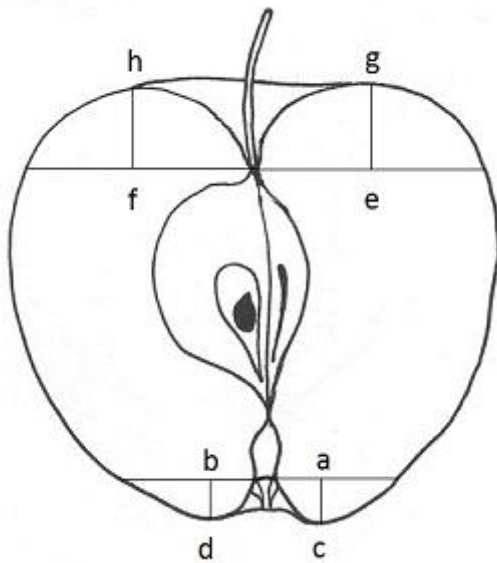
Ad. 39: Fruit: length of stalk



Ad. 40: 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, the larger side should be considered (i.e. in case of depths of stalk cavity: e-g instead of f-h; in case of depth of eye basin: b-d instead of a-c).



f-h = depth of stalk cavity (characteristic 40)

a-c = depth of eye basin (characteristic 42)

a-b = width of eye basin (characteristic 43)

Ad. 42: Fruit: depth of eye basin

See Ad. 40.

Ad. 43: Fruit: width of eye basin

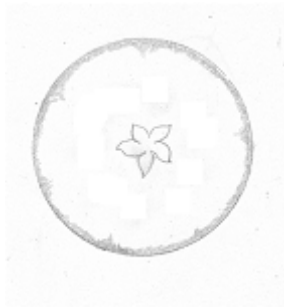
See Ad. 40.

Ad. 44: Fruit: firmness of flesh

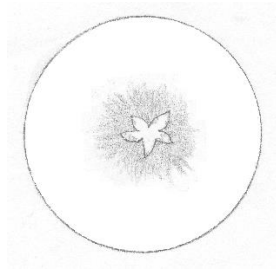
Observations should be made at time of ripeness for eating. It can be measured using a penetrometer.

Ad. 48: Flesh color: distribution of pinkish or reddish coloration

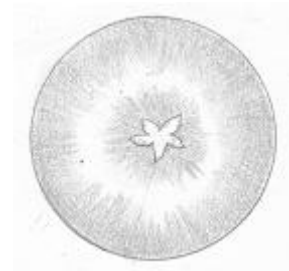
To be observed in cross section.



2  
under skin only



3  
around core only



4  
under skin and around core



5  
throughout

Ad. 49: Time of beginning of flowering

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

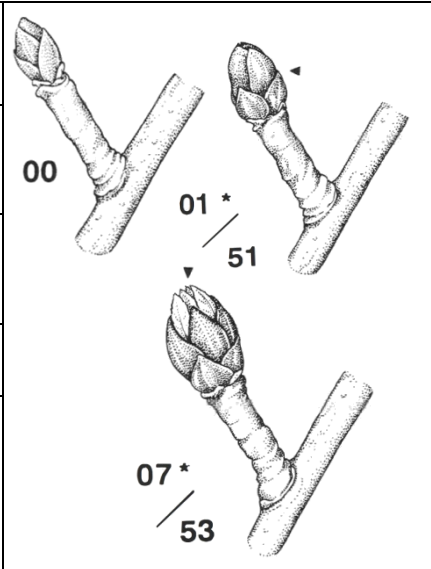
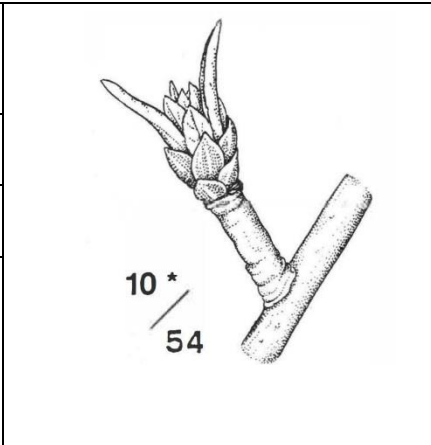
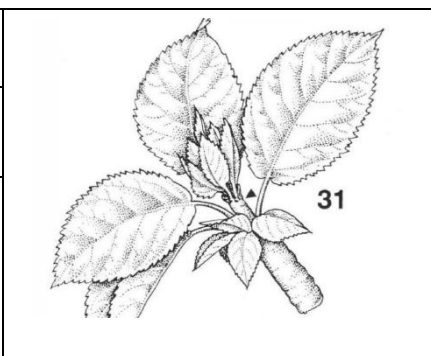
Ad. 50: Time for harvest

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

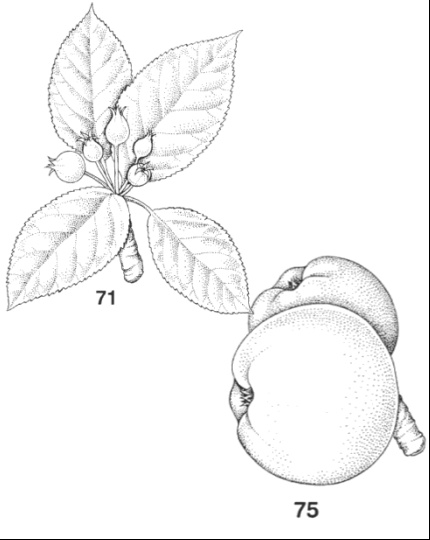
Ad. 51: Time of eating maturity

The time of eating maturity is when the fruit is eating ripe and has reached its optimum of 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 degeneration of starch content in the flesh, the time of eating maturity can also be determined by assessing the starch content.

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

Stage	Explanation	
<b>Principal growth stage 0: Bud development</b>		
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	
<b>Principal growth stage 1: Leaf development</b>		
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	
<b>Principal growth stage 2: (not applicable)</b>		
<b>Principal growth stage 3: Shoot development<sup>4)</sup></b> <sup>4)</sup> 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	

Stage	Explanation	
<b>Principal growth stage 4: (not applicable)</b>		
<b>Principal growth stage 5: Inflorescence emergence</b>		
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)	
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	
<b>Principal growth stage 6: Flowering</b>		
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	

Stage	Explanation	
<b>Principal growth stage 7: Development of fruit</b>		
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	
<b>Principal growth stage 8: Maturity of fruit and seed</b>		
81	Beginning of ripening: lightening of cultivar-specific fruit color	(no drawing)
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	
<b>Principal growth stage 9: Senescence, beginning of dormancy</b>		
91	Shoot growth completed; terminal bud developed; foliage still fully green	(no drawing)
92	Leaves begin to discolor	
93	Beginning of leaf fall	
97	All leaves fallen	
99	Harvested product	

U. Meier, H. Graf, H. Hack, M. Heß, W. Kennel, R. Klose, D. Mappes, D. Seipp, R. Staufß, J. Streif und T. van den Boom (1994): Phenological growth stages of pome fruit (*Malus domestica* Borkh. and *Pyrus communis* L.), stone fruit (*Prunus* species), currants (*Ribes* species) and strawberry (*Fragaria x ananassa* Duch.). Nachrichtenblatt Deutscher Pflanzenschutzdienst 46 (7), S. 141-153; ISSN 0027-7479.

Example varieties	Synonyms
Api Noir	Schwarzer Noir
Auralia	Tumanga
Canada gris	Kanadarenette; Reinette de Caen
Cox's Orange Pippin	Cox Orangenrenette
Gloster	Gloster 69
Golden Delicious	Gelber Köstlicher
Golden Noble	Gelber Edelapfel
Ingrid Marie	Hoed Orange
Rambour d'Hiver	Rheinischer Winterrambur
Teser	TSR 29
Transparente de Croncels	Yellow Transparent
Šampion	Shampion
Schone van Boskoop	Belle de Boskoop; Schöner aus Boskoop
White Transparent	Papirovka, Transparente Jaune, Weißer Klarapfel

## 9. Literature

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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	Botanical name	<input type="text" value="Malus domestica (Suckow) Borkh."/>
1.2	Common name	<input type="text" value="Apple"/>
2. Applicant		
	Name	<input type="text"/>
	Address	<input type="text"/>
	Telephone No.	<input type="text"/>
	Fax No.	<input type="text"/>
	E-mail address	<input type="text"/>
	Breeder (if different from applicant)	<input type="text"/>
3. Proposed denomination and breeder's reference		
	Proposed denomination (if available)	<input type="text"/>
	Breeder's reference	<input type="text"/>

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 variety)

(.....) 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:
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4.2	Method of propagating the variety	
4.2.1	Vegetative propagation	
(a)	Budding or grafting	[ ]
(b)	Other (state method)	[ ]
	<input type="text"/>	
4.2.2	Other (Please provide details)	[ ]
	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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
<b>5.1 Tree: type (2)</b>		
columnar	MacExcel, Wijcik	1 [ ]
ramified	Elstar, Golden Delicious	2 [ ]
<b>5.2 <u>Only varieties with Tree type: ramified:</u> Tree: habit (3)</b>		
upright	Alkmene, Fresco, Solaris	1 [ ]
upright to spreading	Akane, Arkcharm, Harmensz, Katrina, Reka 2	[ ]
spreading	Pinova, Redkan, Topaz	3 [ ]
drooping	Idared, James Grieve, Pivita	4 [ ]
weeping	Gerlinde, Nield's Drooper	5 [ ]
<b>5.3 Fruit: shape (26)</b>		
flat globose conical	Melrose	1 [ ]
oblate	Bramley's Seedling, Lipno	2 [ ]
circular	Dalinbel, Rubinola, Topaz	3 [ ]
elliptic	Fuji BC, Minnewashta	4 [ ]
square	Bonita	5 [ ]
oblong	Renora, Čadel	6 [ ]
ovate	Cripps Pink, Delcorf	7 [ ]
conical	Civni, Elstar, Nicoter, Pinova, Rafzubin	8 [ ]
conical waisted	Gloster, Redkan	9 [ ]
obconical	Empire	10 [ ]
<b>5.4 Fruit: hue of over color (30)</b>		
orange red	Goldstar, Rea Gold, Solaris	1 [ ]
pink red	Cripps Pink, Delorgue	2 [ ]
red	Pinova, Prima, Red Elstar, Tenroy	3 [ ]
purple red	Bay 3484, Luresweet, MC 38, Spartan	4 [ ]
brown red	Braeburn, Fiesta, Fresco, Fuji BC, Suntan	5 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.5 Fruit: relative area of over color (32)</b>		
absent or very small	Granny Smith, Tuscan	1 [ ]
very small to small	Golden Delicious	2 [ ]
small	Auralia, Cox's Orange Pippin, Goldstar, Solaris	3 [ ]
small to medium	Charlotte, Schone van Boskoop	4 [ ]
medium	Dalili, Elstar, Minnewashta, Rea Gold	5 [ ]
medium to large	Heco, Pia, Rafzubin	6 [ ]
large	Fiesta, Santana, Suntan, Tenroy	7 [ ]
large to very large	Mars, Rosy Glow, SQ 159	8 [ ]
very large	Bay 3484, MC 38, Red Jonaprince, Redkan	9 [ ]
<b>5.6 Fruit: pattern of over color (33)</b>		
only solid flush	Bay 3484, Red Jonaprince, Telamon	1 [ ]
solid flush with stripes	Bruggers Festivale, Charlotte, Cripps Pink, Dalili, James Grieve Esselborn, Pingo	2 [ ]
only stripes	Dülmener Rosenapfel	3 [ ]
flushed and mottled	Dalinel, Scifresh	4 [ ]
flushed, striped and mottled	Elstar, Pinova, Rafzubin, Topaz	5 [ ]
marbled	Karneval	6 [ ]
<b>5.7 Fruit: main color of flesh (45)</b>		
white	Akane, Minnewashta, Pia, Spartan	1 [ ]
greenish	Angold, Gloster, Granny Smith, Northpole, Telamon	2 [ ]
yellowish white	Elstar, Jonagold, Pinova, Rafzubin	3 [ ]
yellowish	Coxcolumnar, Pisaxa, Topaz, Zari	4 [ ]
orangish	Ladina, Transcendent Crab	5 [ ]
pinkish	Pomfit	6 [ ]
reddish	Bay 3484, Lureprec	7 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.8 Time of beginning of flowering (49)</b>		
very early	Anna, Ein-Shemer	1 [ ]
very early to early	Collina, Delblush, Pompink	2 [ ]
early	Astramel, Civni, Idared, Topaz	3 [ ]
early to medium	Cripps Red, Dalili, James Grieve, Jonagored	4 [ ]
medium	Braeburn, Rafzubin, Tenroy, White Transparent, Zari	5 [ ]
medium to late	Elise, Gala, Granny Smith, Sansa	6 [ ]
late	Golden Delicious, Karmijn de Sonnaville, Reine de Reinettes, Sirprize	7 [ ]
late to very late	Delorina, Suntan	8 [ ]
very late	Spätblühender Taffetapfel	9 [ ]
<b>5.9 Time for harvest (50)</b>		
extremely early	Astramel, Collina, White Transparent	1 [ ]
extremely early to very early	Piros	2 [ ]
very early	Arkcharm, Lena, Minnewashta, Nela	3 [ ]
very early to early	Bruggers Festivale, Coxcolumnnar, Dalili	4 [ ]
early	Akane, Delorgue, James Grieve, Monidel, Sansa	5 [ ]
early to medium	Gerlinde, Prima, Santana, Zari	6 [ ]
medium	Bay 3484, Fiesta, Rubinola	7 [ ]
medium to late	Civni, Elstar, Karmijn de Sonnaville, Saturn, Suntan, Tenroy	8 [ ]
late	Jonagold, Pomforyou, Redkan, Sirprize, Telamon	9 [ ]
late to very late	Florina, Golden Delicious, La Flamboyante, Pinova, Pompink, Topaz	10 [ ]
very late	Delblush, Delgollune, Fuji BC, Mutsu, Nicoter	11 [ ]
very late to extremely late	Braeburn, Fuji	12 [ ]
extremely late	Cripps Pink, Cripps Red, Granny Smith, Iduna	13 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.10 Time of eating maturity (51)</b>		
extremely early	Samo	1 [ ]
extremely early to very early	Astramel, Julia	2 [ ]
very early	Discovery, Helios, Nela	3 [ ]
very early to early	Bruggers Festivale, Minnewashta	4 [ ]
early	Alkmene, Gravensteiner, James Grieve, Transparent de Croncels	5 [ ]
early to medium	Santana	6 [ ]
medium	Elstar, Gala, Holsteiner Cox, Reine de Reinettes	7 [ ]
medium to late	Honeycrisp, Karneval, Rubinstep	8 [ ]
late	Golden Delicious, Jonagold, Pinova, Topaz	9 [ ]
late to very late	Nicoter, Pilot, Scifresh, Solaris	10 [ ]
very late	Braeburn, Florina	11 [ ]
very late to extremely late	Elise	12 [ ]
extremely late	Cripps Pink, Granny Smith	13 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>One-year-old shoot: number of lenticels</i>	<i>few</i>	<i>many</i>

Comments:



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

In case of a mutant varieties, (a) characteristic(s) should be indicated in which the candidate variety differs from the variety it has originated from, or from any other mutant variety of same origin, if not provided already under 6.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs	Describe the expression of the characteristic(s) for the <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety

# 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:
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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]