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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

APPLE
(Fruit Varieties)

UPOV Code: MALUS_

*Malus*Mill. *

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from United Kingdom

to be considered by the Enlarged Editorial Committee
at its meeting to be held in Geneva, Switzerland, January 11, 2005

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Malus Mill.	Apple	Pommier	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/163/3 Apple Rootstocks
TG/192/1 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), for the latest information.]

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1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Malus* Mill., except for varieties used only as rootstock varieties (see TG/163/3) or only as ornamental varieties (see TG/192/1).

1.2 Any varieties which might be considered as rootstock or ornamental varieties but which might also be used for fruit production should be examined for DUS using these Test Guidelines in addition to the other Test Guidelines mentioned above.

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; 3 budsticks; or 5 dormant shoots for grafting;

(b) varieties resulting from mutation:

10 trees; 6 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

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

3.2 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

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

3.4 Test Design

3.4.1 Varieties resulting from crossing: Each test should be designed to result in a total of at least 5 trees.

3.4.2 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 Number of Plants / Parts of Plants to be Examined

3.5.1 Varieties resulting from crossing: Unless otherwise indicated, all observations should be made on 5 trees or parts taken from each of 5 trees. In the case of parts of the tree, the number to be taken from each of the trees should be 2.

3.5.2 Varieties resulting from mutation: Unless otherwise indicated, all observations should be made on 10 trees or parts taken from each of 10 trees. In the case of parts of the tree, the number to be taken from each of the trees should be 1.

3.6 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.

4.2 Uniformity

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed. 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 tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous 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 ramified tree type: Tree: habit (characteristic 3)

(c) Fruit: general shape (characteristic 28)

(d) Fruit: relative area of over color of skin (characteristic 36)

(e) Fruit: hue of over color - with any bloom removed (characteristic 37)

(f) Fruit: pattern of over color of skin (characteristic 39)

(g) Time of beginning of flowering (characteristic 55)

(h) Time of eating maturity (characteristic 57)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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

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.

6.3 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. The states of expression of the example varieties provided in these Test Guidelines are the states expressed when the example varieties are grown on M9 rootstock.

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3
QN: Quantitative characteristic – see Chapter 6.3
PQ: Pseudo-qualitative characteristic – see Chapter 6.3

(a)–(e) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(+)**		**Tree: vigor**	**Arbre: vigueur**	**Baum: Wuchsstärke**	**Árbol: vigor**		
QN	**(c)**	very weak	très faible	sehr gering	muy débil	Nield's Drooper	1
		weak	faible	gering	débil	Akane	3
		medium	moyenne	mittel	medio	Golden Delicious	5
		strong	forte	stark	fuerte	Bramley's Seedling	7
2. **(*)** **(+)**		**Tree: type**	**Arbre: type**	**Baum: Typ**	**Árbol: tipo**		
QL	**(a)**	columnar	columnaire	säulenförmig	columnar	MacExcel, Wijcik	1
		ramified	ramifié	verzweigt	ramificado	Elstar	2
3. **(*)** **(+)**		**Only varieties with ramified tree type: Tree: habit**	**Seulement pour les variétés dont le type d'arbre est ramifié: Arbre: port**	**Nur Sorten, deren Baumtyp verzweigt ist: Baum: Wuchsform**	**Sólo variedades que tienen un tipo de árbol ramificado: Árbol: porte**		
PQ	**(a)**	fastigiate	très dressé	sehr aufrecht	fastigiado	Benoni	1
		upright	dressé	aufrecht	erecto	Gloster	2
		spreading	divergent	auseinanderfallend	extendido	Bramley's Seedling, Jonagold	3
		drooping	retombant	überhängend	colgante	Jonathan	4
		weeping	pleureur	lang überhängend	llorón	Nield's Drooper, Rome Beauty	5
4. **(+)**		**Tree: type of bearing**	**Arbre: type de fructification**	**Baum: Fruchtansatz**	**Árbol: tipo de producción**		
PQ		on spurs only	sur spurs seulement	nur an Kurztrieben	únicamente en estolones	Starkrimson Delicious	1
		on spurs and long shoots	sur spurs et rameaux longs	an Kurz- und an Langtrieben	en estolones y tallos largos	Jonagold	2
		on long shoots only	sur rameaux longs seulement	nur an Langtrieben	únicamente en tallos largos	Rome Beauty	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. **(+)**		**One-year-old shoot: thickness**	**Rameau d'un an: épaisseur**	**Einjähriger Trieb: Dicke**	**Rama de un año: grosor**		
QN	**(b)**	thin	mince	dünn	delgada	Laxton's Fortune, Remo	3
		medium	moyen	mittel	media	Jonagold	5
		thick	épais	dick	gruesa	Bramley's Seedling	7
		very thick	très épais	sehr dick	muy gruesa	Charlotte, Wijcik	9
6. **(*)** **(+)**		**One-year-old shoot: length of internode**	**Rameau d'un an: longueur des entre-nœuds**	**Einjähriger Trieb: Internodienlänge**	**Rama de un año: longitud de los entrenudos**		
QN	**(b)**	very short	très courts	sehr kurz	muy cortos	MacExcel, Wijcik	1
		short	courts	kurz	cortos	Alkmene, Florina	3
		medium	moyens	mittel	medios	Jonagold, Redaphough	5
		long	longs	lang	largos	Auralia	7
7.		**One-year-old shoot: color on sunny side**	**Rameau d'un an: couleur de la face exposée au soleil**	**Einjähriger Trieb: Farbe an der Sonnenseite**	**Rama de un año: color de la parte expuesta al sol**		
PQ	**(b)**	greenish brown	brun verdâtre	grünlichbraun	marrón verdoso	Granny Smith	1
		reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo	Vicking	2
		light brown	brun clair	hellbraun	marrón claro	Arkcharm	3
		medium brown	brun moyen	mittel braun	marrón medio	Golden Delicious	4
		dark brown	brun foncé	dunkelbraun	marrón oscuro	Ingrid Marie	5
8.		**One-year-old shoot: pubescence (on distal half of shoot)**	**Rameau d'un an: pubescence (sur la partie supérieure du rameau)**	**Einjähriger Trieb: Behaarung (an der distalen Hälfte des Triebs)**	**Rama de un año: pubescencia (en la mitad distal de la rama)**		
QN	**(b)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Laxton's Fortune, Rewena	1
		weak	faible	gering	débil	Golden Delicious	3
		medium	moyenne	mittel	media	Cox's Orange Pippin	5
		strong	forte	stark	fuerte	Bramley's Seedling	7
		very strong	très forte	sehr stark	muy fuerte	Rambour d'Hiver	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9. **(*)**		**One-year-old shoot: number of lenticels**	**Rameau d'un an: nombre de lenticelles**	**Einjähriger Trieb: Anzahl der Lentizellen**	**Rama de un año: número de lenticelas**		
QN	**(b)**	few	petit	gering	bajo	Alkmene, Bramley's Seedling	3
		medium	moyen	mittel	medio	Cox's Orange Pippin	5
		many	grand	groß	alto	Mutsu	7
10. **(*)** **(+)**		**Leaf blade: attitude in relation to shoot**	**Limbe: port par rapport au rameau**	**Blattspreite: Haltung im Verhältnis zum Trieb**	**Limbo: porte en relación con la rama**		
QN	**(c)**	upwards	dressé	aufwärts gerichtet	ascendente	Katja, Redsleeves	1
		outwards	perpendiculaire	abstehend	horizontal	Bramley's Seedling	2
		downwards	retombant	abwärts gerichtet	descendente	Granny Smith, Schone van Boskoop	3
11. **(*)**		**Leaf blade: length**	**Limbe: longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
QN	**(c)**	very short	très court	sehr kurz	muy corto	Reanda	1
		short	court	kurz	corto	Court Pendu Plat	3
		medium	moyen	mittel	medio	Florina	5
		long	long	lang	largo	Bramley's Seedling	7
12. **(*)**		**Leaf blade: width**	**Limbe: largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
QN	**(c)**	narrow	étroit	schmal	estrecho	Cox's Orange Pippin	3
		medium	moyen	mittel	medio	Jonagold	5
		broad	large	breit	ancho	Bramley's Seedling	7
13. **(*)**		**Leaf blade: ratio length/width**	**Limbe: rapport longueur/largeur**	**Blattspreite: Verhältnis Länge/Breite**	**Limbo: relación entre la longitud y la anchura**		
QN	**(c)**	small	faible	klein	pequeña	Bramley's Seedling	3
		medium	moyen	mittel	media	Jonagold	5
		large	élevé	groß	grande	Granny Smith	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14.		**Leaf blade: intensity of green color**	**Limbe: intensité de la couleur verte**	**Blattspreite: Grünfärbung**	**Limbo: intensidad del color verde**		
QN	**(c)**	light	claire	hell	claro	Golden Delicious, Sansa	3
		medium	moyenne	mittel	medio	James Grieve	5
		dark	foncée	dunkel	oscuro	Mutsu	7
15. **(+)**		**Leaf blade: incisions of margin (upper half)**	**Limbe: incisions du bord (moitié supérieure)**	**Blattspreite: Rand-einschnitte (obere Hälfte)**	**Limbo: incisiones del borde (mitad superior)**		
PQ	**(c)**	crenate	crénelées	gekerbt	crenadas	Summerred	1
		bicrenate	bicrénelées	doppelt gekerbt	bicrenadas	Alkmene, Jim Brian	2
		serrate type 1	en scie simple type 1	gesägt Typ 1	serradas (tipo 1)	Elstar, Gala	3
		serrate type 2	en scie simple type 2	gesägt Typ 2	serradas (tipo 2)	Sirprize	4
		biserrate	en scie double	doppelt gesägt	biserradas	Freedom, Mutsu, Schone van Boskoop	5
16.		**Leaf blade: pubescence on lower side**	**Limbe: pilosité de la face inférieure**	**Blattspreite: Behaarung der Unterseite**	**Limbo: pubescencia del lado inferior**		
QN	**(c)**	absent or weak	absente ou faible	fehlend oder sehr gering	ausente o débil	Golden Delicious	1
		medium	moyenne	mittel	media	Cox's Orange Pippin, Elstar	2
		strong	forte	stark	fuerte	James Grieve, Jonathan	3
17. **(*)**		**Petiole: length**	**Pétiole: longueur**	**Blattstiel: Länge**	**Peciolo: longitud**		
QN	**(c)**	short	court	kurz	corto	Jonagold	3
		medium	moyen	mittel	medio	Granny Smith	5
		long	long	lang	largo	Falstaff	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.		**Petiole: extent of anthocyanin coloration from base**	**Pétiole: extension de la coloration anthocyanique**	**Blattstiel: Ausdehnung der Anthocyanfärbung von der Basis an**	**Pecíolo: extensión de la coloración antociánica**		
QN	**(c)**	small	petite	gering	pequeña	Golden Delicious, Jonagold	3
		medium	moyenne	mittel	media	Cox's Orange Pippin, Gala	5
		large	grande	hoch	grande	Discovery, Richared Delicious	7
19. **(*)** **(+)**		**Flower: predominant color at balloon stage**	**Fleur: couleur (au stade ballon)**	**Blüte: Vorwiegende Farbe (Ballonstadium)**	**Flor: color predominante en la fase de capullo**		
PQ	**(d)**	white	blanc	weiß	blanco	Norhey	1
		yellowish pink	rose jaunâtre	gelblichrosa	rosa amarillento	Schöner aus Herrenhut, Worcester Pearmain	2
		light pink	rose pâle	hellrosa	rosa claro	Gravensteiner, Jonathan	3
		dark pink	rose foncé	dunkelrosa	rosa oscuro	Elstar, Sylvia	4
		medium red	rouge moyen	mittelrot	rojo medio	Kidd's Orange Red	5
		dark red	rouge foncé	dunkelrot	rojo oscuro	Weirouge	6
		purple	pourpre	purpurn	púrpura	Rafzubin	7
20. **(*)**		**Flower: diameter of flower with petals pressed into horizontal position**	**Fleur: diamètre de la fleur avec les pétales étalés dans un plan horizontal**	**Blüte: Durchmesser der Blüte bei in waagerechte Position gedrückten Blütenblättern**	**Flor: diámetro de la flor con los pétalos extendidos en posición horizontal**		
QN	**(d)**	very small	très petit	sehr klein	muy pequeño	Freedom, Spätblühender Taffettapfel	1
		small	petit	klein	pequeño	Jonafree	3
		medium	moyen	mittel	medio	Cox's Orange Pippin	5
		large	grand	groß	grande	Schone van Boskoop	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. **(*)** **(+)**		**Flower: arrangement of petals**	**Fleur: disposition des pétales**	**Blüte: Anordnung der Blütenblätter**	**Flor: disposición de los pétalos**		
PQ	**(d)**	free	indépendants	freistehend	separados	Worcester Pearmain	1
		intermediate	intermédiaire	intermediär	intermedios	Golden Delicious, Jonagold, Topaz	2
		overlapping	se recouvrant	überlappend	solapados	Schone van Boskoop	3
22. **(+)**		**Flower: position of stigmas relative to anthers**	**Fleur: position des stigmates par rapport aux anthères**	**Blüte: Stellung der Narben im Verhältnis zu den Staubfäden**	**Flor: posición de los estigmas en relación con las anteras**		
QN	**(d)**	below	au-dessous	unterhalb	por debajo	Alkmene	1
		same level	au même niveau	auf gleicher Höhe	al mismo nivel	Cox's Orange Pippin	2
		above	au-dessus	oberhalb	por encima	Golden Delicious	3
23. **(+)**		**Young fruit: extent of anthocyanin overcolor**	**Jeune fruit: extension de la coloration anthocyanique**	**Junge Frucht: Ausdehnung der Anthocyan-Deckfarbe**	**Fruto joven: extensión de la coloración antociánica**		
QN		absent or very small	absente ou très petite	fehlend oder sehr gering	ausente o muy pequeña	Grenadier, Norhey	1
		small	petite	gering	pequeña	Fuji	3
		medium	moyenne	mittel	media	Idared	5
		large	grande	stark	grande	Elise	7
		very large	très grande	sehr stark	muy grande	Weirouge	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24. (*)		**Fruit: size**	**Fruit: taille**	**Frucht: Größe**	**Fruto: tamaño**		
QN	**(e)**	very small	très petit	sehr klein	muy pequeño	Api Noir	1
		very small to small	très petit à petit	sehr klein bis klein	muy pequeño a pequeño	Golden Harvey	2
		small	petit	klein	pequeño	Akane, Miller's Seedling	3
		small to medium	petit à moyen	klein bis mittel	pequeño a medio	Alkmene	4
		medium	moyen	mittel	medio	Cox's Orange Pippin	5
		medium to large	moyen à gros	mittel bis groß	medio a grande	Gravensteiner	6
		large	gros	groß	grande	Mutsu	7
		large to very large	gros à très gros	groß bis sehr groß	grande a muy grande	Bramley's Seedling	8
		very large	très gros	sehr groß	muy grande	Howgate Wonder	9
25. (*)		**Fruit: maximum height**	**Fruit: hauteur maximale**	**Frucht: Höhe**	**Fruto: altura**		
QN	**(e)**	short	court	niedrig	corto	Auralia	3
		medium	moyen	mittel	medio	James Grieve	5
		tall	haut	hoch	alto	Čadel, Iduna	7
26. (*)		**Fruit: maximum diameter**	**Fruit: diamètre maximum**	**Frucht: maximaler Durchmesser**	**Fruto: diámetro máximo**		
QN	**(e)**	small	petit	klein	pequeño	Orei	3
		medium	moyen	mittel	medio	Golden Delicious	5
		large	grand	groß	grande	Melrose	7
27. (*)		**Fruit: ratio maximum height/ maximum diameter**	**Fruit: rapport hauteur maximale/ diamètre maximum**	**Frucht: Verhältnis maximale Höhe/maximaler Durchmesser**	**Fruto: relación altura máxima/ diámetro máximo**		
QN	**(e)**	very small	très petit	sehr klein	muy pequeña	Court Pendu Plat, Ingol	1
		small	petit	klein	pequeña	Idared, Ontario	3
		medium	moyen	mittel	mediana	Jonagold	5
		large	grand	groß	grande	Golden Delicious	7
		very large	très grand	sehr groß	muy grande	Iduna, Priam	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28. (*) (+)		**Fruit: general shape**	**Fruit: forme générale**	**Frucht: allgemeine Form**	**Fruto: forma general**		
PQ	**(e)**	conic	conique	kegelförmig	cónica	Jonagold	1
		ovoid	ovoïde	eiförmig	ovoide	Summerred	2
		oblong	oblong	rechteckig	oblonga	Gravensteiner, Mutsu	3
		ellipsoid	ellipsoïde	ellipsoid	elipsoide	Spencer	4
		globose	globuleux	kugelförmig	globulosa	Golden Noble, Resi	5
		obloid	obloïde	breit kugelförmig	obloide	Bramley's Seedling, Idared	6
		oblong waisted	oblong étranglé	rechteckig tailliert	oblonga entallada	Gloster	7
29.		**Fruit: ribbing**	**Fruit: côtes**	**Frucht: Rippung**	**Fruto: acostillado**		
QN	**(e)**	absent or weak	absentes ou faibles	fehlend oder gering	ausente o débil	Charles Ross, Discovery	1
		moderate	moyennes	mittel	moderado	Golden Delicious	2
		strong	fortes	stark	fuerte	Red Delicious, Reinette Russet	3
30.		**Fruit: crowning at calyx end**	**Fruit: couronnement au sommet du calice**	**Frucht: Wülste oder Höcker am Kelchende**	**Fruto: remate del extremo del cáliz**		
QN	**(e)**	absent or weak	absent ou faible	fehlend oder gering	ausente o débil	Charles Ross, Discovery, Granny Smith	1
		moderate	moyen	mittel	moderado	Cox's Orange Pippin, Jonagold	2
		strong	forte	stark	fuerte	Red Delicious	3
31. (*)		**Fruit: size of eye**	**Fruit: taille de l'œil**	**Frucht: Größe des Kelches**	**Fruto: tamaño del ojo**		
QN	**(e)**	small	petit	klein	pequeño	McIntosh	3
		medium	moyen	mittel	medio	Cox's Orange Pippin	5
		large	grand	groß	grande	Ingol, Monarch	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32.		**Fruit: length of sepal**	**Fruit: longueur du sépale**	**Frucht: Länge des Kelchblattes**	**Fruto: longitud del sépalo**		
QN	**(e)**	short	court	kurz	corto	McIntosh	3
		medium	moyen	mittel	medio	Alkmene	5
		long	long	lang	largo	Gala	7
33. **(*)**		**Fruit: bloom of skin**	**Fruit: pruine de l'épiderme**	**Frucht: Bereifung der Schale**	**Fruto: pruina de la epidermis**		
QN	**(e)**	absent or weak	absent ou faible	fehlend oder gering	ausente o débil	Golden Delicious	1
		moderate	moyen	mittel	moderada	James Grieve, Jonathan	2
		strong	fort	stark	fuerte	Vicking, Vista Bella	3
34.		**Fruit: greasiness of skin**	**Fruit: état cireux de l'épiderme**	**Frucht: Fettigkeit der Schale**	**Fruto: estado graso de la epidermis**		
QN	**(e)**	absent or weak	absent ou faible	fehlend oder gering	ausente o débil	Schone van Boskoop	1
		moderate	moyen	mittel	moderado	James Grieve	2
		strong	fort	stark	fuerte	Arlet, Jonagold	3
35. **(*)**		**Fruit: ground color of skin**	**Fruit: couleur du fond de l'épiderme**	**Frucht: Grundfarbe der Schale**	**Fruto: color de fondo de la epidermis**		
PQ	**(e)**	not visible	non visible	nicht sichtbar	no visible	Red Jonaprince	1
		whitish yellow	jaune blanchâtre	weißlichgelb	amarillo blanquecino	Silken	2
		yellow	jaune	gelb	amarillo	Delorgue, Gala, Transparent de Croncels	3
		whitish green	vert blanchâtre	weißlichgrün	verde blanquecino	Angold, Lodi, Lena, White Transparent	4
		yellow green	vert-jaune	gelbgrün	verde amarillento	Cox's Orange Pippin	5
		green	vert	grün	verde	Granny Smith	6

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
36. (*)		**Fruit: relative area of over color of skin**	**Fruit: proportion de lavis de l'épiderme**	**Frucht: relativer Deckfarbenanteil der Schale**	**Fruto: zona relativa del color superior de la epidermis**		
QN	**(e)**	absent or very small	nulle ou très petite	fehlend oder sehr klein	ausente o muy pequeña	Granny Smith	1
		small	petite	klein	pequeña	Auralia, Cox's Orange Pippin	3
		medium	moyenne	mittel	media	Gala	5
		large	grande	groß	grande	Spartan	7
		very large	très grande	sehr groß	muy grande	Red Jonaprince	9
37. (*)		**Fruit: hue of over color – with any bloom removed**	**Fruit: teinte du lavis – une fois la pruine (si présente) enlevée**	**Frucht: Ton der Deckfarbe – Bereifung (soweit vorhanden) entfernt**	**Fruto: tono del color superior, una vez retirada la pruina**		
PQ	**(e)**	orange red	rouge orangé	orangerot	rojo anaranjado	Cox's Orange Pippin, Egremont Russet	1
		pink red	rouge-rose	rosarot	rojo rosado	Cripps Pink, Delorgue	2
		red	rouge	rot	rojo	Akane, Galaxy, Red Elstar, Regal Prince	3
		purple red	rouge-pourpre	purpurrot	rojo púrpura	Red Jonaprince, Spartan	4
		brown red	rouge-brun	braunrot	rojo pardo	Fiesta, Joburn, Lord Burghley	5
38. (*) (+)		**Fruit: intensity of over color**	**Fruit: intensité du lavis**	**Frucht: Intensität der Deckfarbe**	**Fruto: intensidad del color superior**		
QN	**(e)**	light	claire	hell	claro	*see Chapter 8.2/ voir chapitre 8.2/ siehe Kapitel 8.2/ véase capítulo 8.2*	3
		medium	moyenne	mittel	medio		5
		dark	foncée	dunkel	oscuro		7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. (*)		**Fruit: pattern of over color of skin**	**Fruit: distribution du lavis de l'épiderme**	**Frucht: Verteilung der Deckfarbe der Schale**	**Fruto: distribución del color superior de la epidermis**		
PQ	**(e)**	only solid flush	seulement en plages continues	nur geflammt	de manera puramente uniforme	Red Jonaprince, Richared Delicious	1
		solid flush with weakly defined stripes	en plages continues avec rayures faiblement délimitées	geflammt mit schwach abgegrenzten Streifen	uniforme con estrías levemente delimitadas	Galaxy	2
		solid flush with strongly defined stripes	en plages continues avec rayures fortement délimitées	geflammt mit stark abgegrenzten Streifen	uniforme con estrías claramente delimitadas	Jonagored	3
		weakly defined flush with strongly defined stripes	en plages continues faiblement exprimées avec rayures fortement délimitées	schwach abgegrenzte Flammung mit stark abgegrenzten Streifen	de manera leve y uniforme con estrías claramente delimitadas	Gravensteiner	4
		only stripes (no flush)	rayures seulement	nur Streifen (keine Flammung)	únicamente en estrías	Helios	5
		flushed and mottled	en plages continues et tacheté	geflammt und punktiert	uniforme y jaspeado	Elstar	6
		flushed, striped and mottled	en plages continues, rayé et tacheté	geflammt, gestreift und punktiert	uniforme, estriado y jaspeado	Jonagold	7
40. (*)		**Fruit: width of stripes**	**Fruit: largeur des rayures**	**Frucht: Breite der Streifen**	**Fruto: anchura de las estrías**		
QN	**(e)**	narrow	étroites	schmal	estrechas	Eden, Pinova, Pirella	3
		medium	moyennes	mittel	medias	Rubinola, Tenroy	5
		broad	larges	breit	anchas	Baigent, Caudle	7
41. (*)		**Fruit: area of russet around stalk attachment**	**Fruit: proportion de roussissure autour du pédoncule**	**Frucht: Fläche der Berostung im Bereich des Stielansatzes**	**Fruto: matiz pardo en torno a la base peduncular**		
QN	**(e)**	absent or small	nulle ou petite	fehlend oder klein	ausente o pequeño	Elstar, Granny Smith, Piros	1
		medium	moyenne	mittel	medio	Alkmene	2
		large	grande	groß	grande	Egremont Russet, Kaiser Wilhelm	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42.		**Fruit: area of russet on cheeks**	**Fruit: proportion de roussissure sur les joues**	**Frucht: Fläche der Berostung auf den Wangen**	**Fruto: matiz pardo de las caras**		
QN	**(e)**	absent or small	nulle ou petite	sehr klein	ausente o pequeño	Golden Noble	1
		medium	moyenne	mittel	medio	Karmijn de Sonnaville	2
		large	grande	groß	grande	Egremont Russet, Zabergäu Reinette	3
43. (*)		**Fruit: area of russet around eye basin**	**Fruit: proportion de roussissure autour de la cuvette de l'œil**	**Frucht: Fläche der Berostung im Bereich der Kelchgrube**	**Fruto: matiz pardo de la cavidad del ojo**		
QN	**(e)**	absent or small	nulle ou petite	fehlend oder klein	ausente o pequeño	Golden Noble	1
		medium	moyenne	mittel	medio	Cox's Orange Pippin	2
		large	grande	groß	grande	Arlet	3
44.		**Fruit: number of lenticels**	**Fruit: nombre de lenticelles**	**Frucht: Anzahl der Lentizellen**	**Fruto: número de lentículos**		
QN	**(e)**	few	petit	klein	bajo	James Grieve	3
		medium	moyen	mittel	medio	Golden Delicious	5
		many	grand	groß	alto	Granny Smith	7
45.		**Fruit: size of lenticels**	**Fruit: taille des lenticelles**	**Frucht: Größe der Lentizellen**	**Fruto: tamaño de los lentículos**		
QN	**(e)**	small	petites	klein	pequeños	Idared, Jonathan	3
		medium	moyennes	mittel	medios	Elstar	5
		large	grandes	groß	grandes	Florina, Reine de Reinettes	7
46. (*)		**Fruit: length of stalk**	**Fruit: longueur du pédoncule**	**Frucht: Länge des Stiels**	**Fruto: longitud del pedúnculo**		
QN	**(e)**	very short	très court	sehr kurz	muy corto	Egremont Russet	1
		short	court	kurz	corto	Cox's Orange Pippin	3
		medium	moyen	mittel	medio	Worcester Pearmain	5
		long	long	lang	largo	Richared Delicious	7
		very long	très long	sehr lang	muy largo	Pinova, Rewena, Sirprize	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
47. (*)		**Fruit: thickness of stalk**	**Fruit: grosseur du pédoncule**	**Frucht: Dicke des Stiels**	**Fruto: grosor del pedúnculo**		
QN	**(e)**	thin	fin	dünn	delgado	Golden Delicious	3
		medium	moyen	mittel	medio	Cox's Orange Pippin	5
		thick	gros	dick	grueso	Schone van Boskoop	7
48. (*) (+)		**Fruit: depth of stalk cavity**	**Fruit: profondeur de la cavité du pédoncule**	**Frucht: Tiefe der Stielgrube**	**Fruto: profundidad de la cavidad peduncular**		
QN	**(e)**	shallow	peu profonde	flach	poco profunda	Edward VII	3
		medium	moyenne	mittel	media	Golden Delicious	5
		deep	profonde	tief	profunda	Jonagold, Schone van Boskoop	7
49. (*) (+)		**Fruit: width of stalk cavity**	**Fruit: largeur de la cavité du pédoncule**	**Frucht: Breite der Stielgrube**	**Fruto: anchura de la cavidad peduncular**		
QN	**(e)**	narrow	étroite	schmal	estrecha	Beauty of Bath, Gala	3
		medium	moyenne	mittel	media	Golden Delicious	5
		broad	large	breit	ancha	Jonagold	7
50. (*) (+)		**Fruit: depth of eye basin**	**Fruit: profondeur de la cuvette de l'œil**	**Frucht: Tiefe der Kelchgrube**	**Fruto: profundidad de la cavidad del ojo**		
QN	**(e)**	shallow	peu profonde	flach	poco profunda	Worcester Pearmain	3
		medium	moyenne	mittel	media	Golden Delicious	5
		deep	profonde	tief	profunda	Bramley's Seedling, Delcorf	7
51. (*) (+)		**Fruit: width of eye basin**	**Fruit: largeur de la cuvette de l'œil**	**Frucht: Breite der Kelchgrube**	**Fruto: anchura de la cavidad del ojo**		
QN	**(e)**	narrow	étroite	schmal	estrecha	Pinova, Worcester Pearmain	3
		medium	moyenne	mittel	media	Golden Delicious	5
		broad	large	breit	ancha	Bramley's Seedling	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52. (*) (+)		**Fruit: firmness of flesh**	**Fruit: fermeté de la chair**	**Frucht: Festigkeit des Fruchtfleisches**	**Fruto: firmeza de la pulpa**		
QN	**(e)**	very soft	très molle	sehr weich	muy blanda	Astrachan	1
		soft	molle	weich	blanda	Jonagold	3
		medium	moyenne	mittel	media	Cox's Orange Pippin	5
		firm	ferme	fest	firme	Kent	7
		very firm	très ferme	sehr fest	muy firme	Pilot, Scifresh	9
53. (*)		**Fruit: color of flesh**	**Fruit: couleur de la chair**	**Frucht: Farbe des Fruchtfleisches**	**Fruto: color de la pulpa**		
PQ	**(e)**	white	blanc	weiß	blanco	Akane, Spartan	1
		cream	crème	cremefarben	crema	Jonagold	2
		yellowish	jaunâtre	gelblich	amarillento	Delorina, Topaz	3
		greenish	verdâtre	grünlich	verdoso	Gloster, Granny Smith	4
		pinkish	rosâtre	blaßrosa	rosáceo	Pomfit	5
		reddish	rougeâtre	rötlich	rojizo	Weirouge	6
54. (*) (+)		**Fruit: aperture of locules (in transverse section)**	**Fruit: ouverture des loges carpellaires (en section transversale)**	**Frucht: Öffnung der Kernkammern (im Querschnitt)**	**Fruto: apertura de los lóbulos (en sección transversal)**		
QN	**(e)**	closed or slightly open	fermées ou légèrement ouvertes	geschlossen oder wenig offen	cerrados o ligeramente abiertos	Idared, Worcester Pearmain	1
		moderately open	modérément ouvertes	teilweise offen	moderadamente abiertos	Reine de Reinettes, Šampion	2
		fully open	complètement ouvertes	vollkommen offen	completamente abiertos	McIntosh	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
55. **(*)** **(+)**		**Time of beginning of flowering**	**Époque de début de floraison**	**Zeitpunkt des Blüh-beginns**	**Época de inicio de la floración**		
QN	**(e)**	very early	très précoce	sehr früh	muy temprana	Anna, Ein-Shemer	1
		early	précoce	früh	temprana	Idared	3
		medium	moyenne	mittel	media	Cox's Orange Pippin, Jonagold	5
		late	tardive	spät	tardía	Court Pendu Plat	7
		very late	très tardive	sehr spät	muy tardía	Feuillemorte, Spätblühender Taffetapfel	9
56. **(+)**		**Time for harvest**	**Époque de récolte**	**Zeitpunkt der Pflückreife**	**Época de la cosecha**		
QN	**(e)**	very early	très précoce	sehr früh	muy temprana	Vista Bella	1
		early	précoce	früh	temprana	Discovery, Jerseymac, Sunrise	3
		medium	moyenne	mittel	media	Cox's Orange Pippin, Elstar, Gala	5
		late	tardive	spät	tardía	Golden Delicious, Jonagold	7
		very late	très tardive	sehr spät	muy tardía	Granny Smith, Cripps Pink	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
57. (*) (+)		**Time of eating maturity**	**Époque de maturité pour la consommation**	**Zeitpunkt der Genußreife**	**Época de madurez para el consumo**		
QN	**(e)**	very early	très précoce	sehr früh	muy precoz	Vista Bella	1
		very early to early	très précoce à précoce	sehr früh bis früh	muy precoz a precoz	White Transparent	2
		early	précoce	früh	precoz	Discovery, Jerseymac, Mountain Cove, Sunrise	3
		early to medium	précoce à moyenne	früh bis mittel	precoz a media	Akane, James Grieve, Summerred	4
		medium	moyenne	mittel	media	Elstar, Gala, Honeycrisp	5
		medium to late	moyenne à tardive	mittel bis spät	media a tardía	Ambrosia, Spartan, Šampion	6
		late	tardive	spät	tardía	Golden Delicious	7
		late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía	Fuji	8
		very late	très tardive	sehr spät	muy tardía	Cripps Pink, Granny Smith	9

8. Explanations on the Table of Characteristics

8.1 Explanations Covering Several Characteristics

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

(a) Tree: type and habit: Observations should be made on bare trees in winter.

(b) One-year-old shoot: Observations on one-year-old shoots should be made on lateral dormant shoots in winter, on trees that have completed at least one growing season at the testing center.

(c) Tree vigor, leaf blade, petiole: Observations on the tree vigor, leaf blade and petiole should be made in summer when the tree is in peak vegetative growth. Observations on the leaf blade and petiole should be made on fully developed leaves from the middle third of vigorous current season shoots from the outside of the tree.

(d) Flower: Observations on the flower should be made on the second or subsequent flowers, at the start of anther dehiscence.

(e) Fruit: Observations on the fruit should be made on 10 typical fruits taken from a minimum sample of 20 fruits, at the time of ripeness for eating. The terminal (king) fruit should be excluded from the sample.

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.

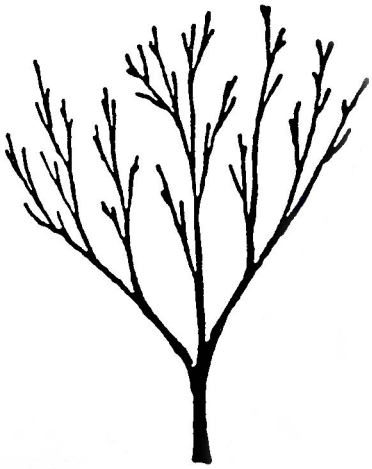
Ad. 2: Tree: type

Columnar: a compact spur-type tree form with virtually no side branches. Closely spaced short fruiting spurs are produced along the main stem.

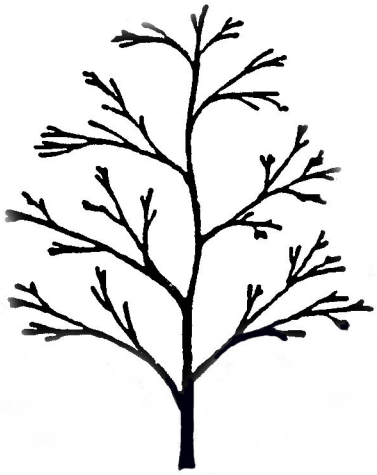
Ramified: form where trees have well developed branches.

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

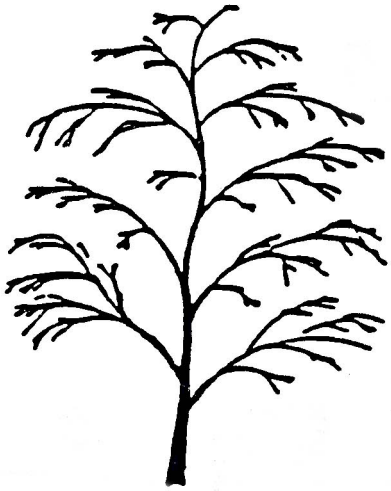
1
fastigiate



2
upright



3
spreading



4
drooping

5
weeping

Ad. 4: Tree: type of bearing

All observations on the type of bearing and on the young fruit should be made 40 days after flowering.

1	2	3
on spurs only	on spurs and long shoots	on long shoots only

Ad. 5: One-year-old shoot: thickness

The thickness of the one-year-old shoot should be observed in the center of the middle internode. Measurements can be made using a vernier caliper gauge.

Ad. 6: 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.

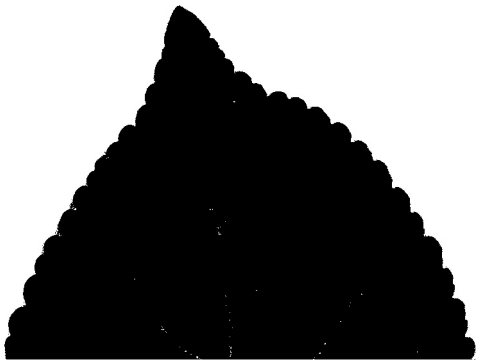
Ad. 10: Leaf blade: attitude in relation to shoot

The attitude of the leaf blade is observed on erect shoots.

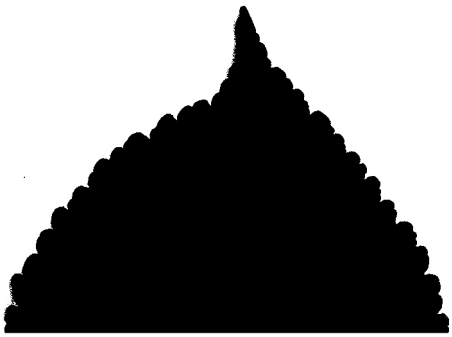
1	2	3
upwards	outwards	downwards

Ad. 15: Leaf blade: incisions of margin (upper half)

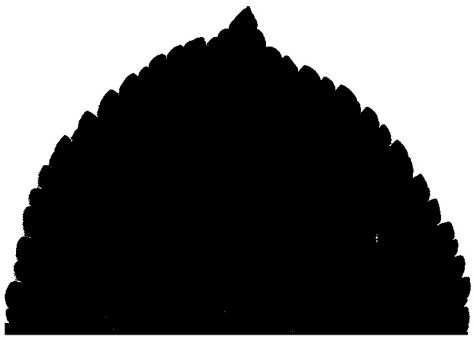
The predominant type of incision should be observed.



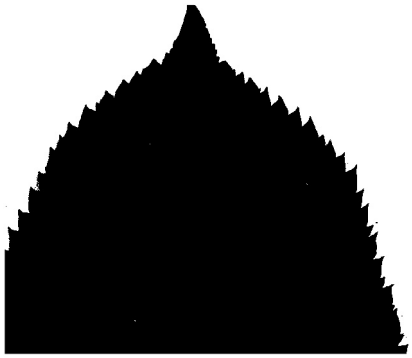
1
crenate



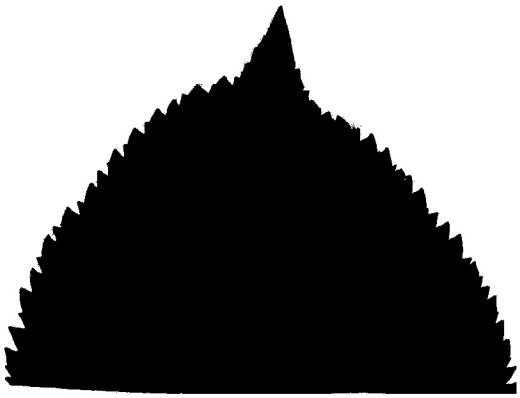
2
bicrenate



3
serrate type 1



4
serrate type 2

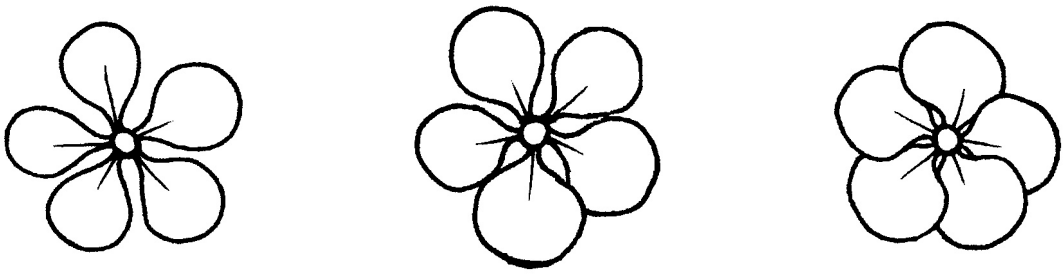


5
biserrate

Ad. 19: Flower: predominant color at balloon stage

'Balloon stage' is the phenological stage in the course of flower development when the calyx is fully expanded and the petals are recognizable, having partially expanded and inflated but are closed, covering the internal flower organs. Balloon stage is usually 1-2 days before the petals unfold.

Ad. 21: Flower: arrangement of petals

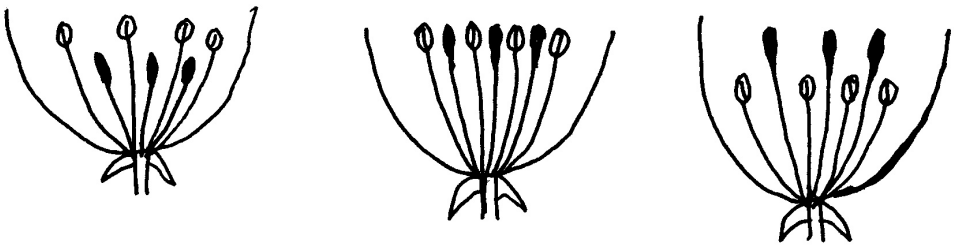


1
free

2
intermediate

3
overlapping

Ad. 22: Flower: position of stigmas relative to anthers



1
below

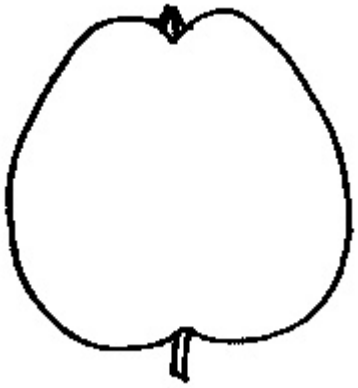
2
same level

3
above

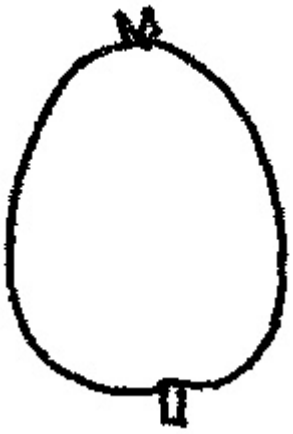
Ad. 23: Young fruit: extent of anthocyanin overcolor

All observations on the type of bearing and on the young fruit should be made 40 days after flowering.

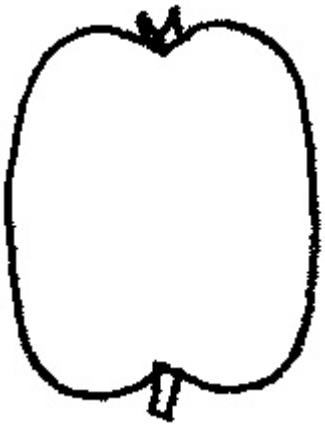
Ad. 28: Fruit: general shape



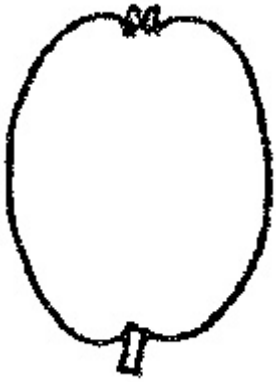
1
conic



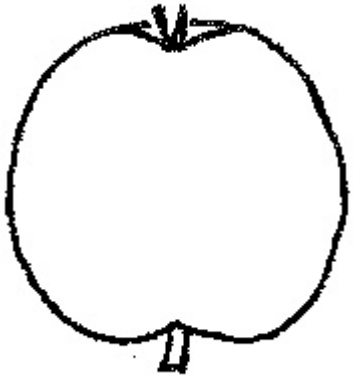
2
ovoid



3
oblong

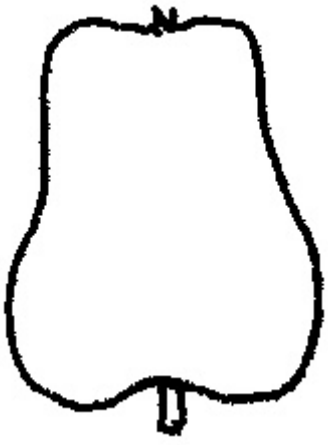


4
ellipsoid



5
globose

6
obloid



7
oblong waisted

Table of additional example varieties with conic shape (state 1):

Fruit: maximum height (char. 25)	Fruit: ratio maximum height/maximum diameter (char. 27)					
		very small	small	medium	large	very large
	short	Regia	Cox's Orange Pippin			
	medium		Melodie	Kidd's Orange Red	Pinova	
	tall			Jonagold		Kent, Adam's Pearmain, Saturn

Table of additional example varieties with obloid shape (state 6):

Fruit: maximum height (char. 25)	Fruit: ratio maximum height/maximum diameter (char. 27)		
		very small	small
	very short	Court Pendu Plat	
	short	Discovery	
	medium		Idared
	tall		Bramley's Seedling

Ad. 38: Fruit: intensity of overcolor

Fruit: hue of overcolor - with any bloom removed (char. 37)	Intensity		
	light	medium	dark
orange red	Egremont Russet, Scigold, Sirprize	Cox's Orange Pippin, Reine de Reinettes	
pink red	Lady Williams	Cripps Pink	Delorgue
red	Winter Banana	Gala	Akane, Galaxy, Red Elstar, Regal Prince
purple red			Red Jonaprince, Spartan
brown red	Sturmer Pippin	Fiesta	Lord Burgley, Joburn

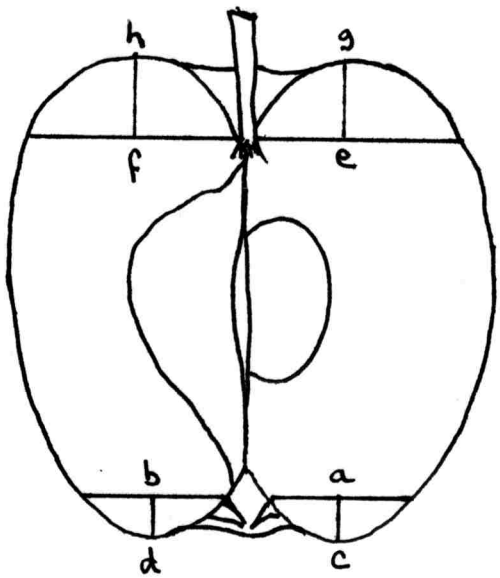
Ad. 48-51: Fruit: depth and width of stalk cavity; depth and width of eye basin

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.

f-h = depth of stalk cavity (characteristic 48)

e-f = width of stalk cavity (characteristic 49)



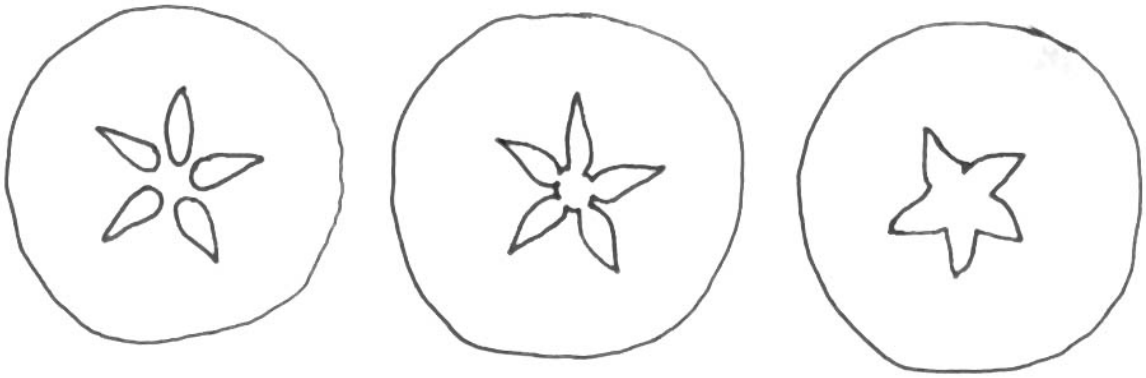
a-b = width of eye basin (characteristic 51)

a-c = depth of eye basin (characteristic 50)

Ad. 52: Fruit: firmness of flesh

Firmness of flesh should be assessed at time of ripeness for eating. It can be measured using a penetrometer.

Ad. 54: Fruit: aperture of locules (in transverse section)



1	2	3
closed or slightly open	moderately open	fully open

Ad. 55: Time of beginning of flowering

Time of beginning of flowering is when 10% of the flowers are fully open.

Ad. 56: Time for harvest

Time for harvest is the optimum time of picking to achieve fruit in peak condition for eating.

Ad. 57: Time of eating maturity

Time of eating maturity is the period when a fruit has reached optimum color, firmness, texture, aroma and flavor for consumption. Depending on the type of fruit, this period can occur directly after removal from the tree (e.g. early pomefruit varieties) or after a period of storage or conditioning (e.g. later pomefruit varieties).

8.3 Other Names of the Example Varieties

Example Varieties	Other Names
Akane	Primrouge
Alkmene	Early Windsor
Auralia	Tumanga
Cox's Orange Pippin	Cox Orangenrenette
Delorina	Harmonie
Florina	Querina
Gloster	Gloster 69
Golden Delicious	Gelber Köstlicher
Golden Noble	Gelber Edelapfel
Gravensteiner	Graasten
Mountain Cove	Gingergold
Mutsu	Crispin
Nouvelle Europe	New Europe
Pinova	Corail
Rafzubin	Rubinette
Red Jonaprince	Jonaprince; Red Prince; Wilton's Jonaprince
Regal Prince	Gala Must; Prince Gala
Reine de Reinettes	Bonnin; Goldparmäne; Plassart; Wintergoldparmäne
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	*Malus* Mill.
1.2	Common name	Apple

2.	Applicant	
	Name	
	Address	
	Telephone No.	
	Fax No.	
	E-mail address	
	Breeder (if different from applicant)	

3.	Proposed denomination and breeder's reference	
	Proposed denomination (if available)	
	Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(b) partially known cross [ ]
(please state known parent variety(ies))
(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation
(a) grafting
(b) other
(state method)

4.2.2 Other
(please state 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:

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: type**		
	columnar	MacExel, Wijcik	1[ ]
	ramified	Elstar	2[ ]
5.2 (3)	**<u>Only varieties with ramified tree type</u>: Tree: habit**		
	fastigiate	Benoni	1[ ]
	upright	Gloster	2[ ]
	spreading	Bramley's Seedling, Jonagold	3[ ]
	drooping	Jonathan	4[ ]
	weeping	Nield's Drooper, Rome Beauty	5[ ]
5.3 (28)	**Fruit: general shape**		
	conic	Jonagold	1[ ]
	ovoid	Summerred	2[ ]
	oblong	Gravensteiner, Mutsu	3[ ]
	ellipsoid	Spencer	4[ ]
	globose	Golden Noble, Resi	5[ ]
	obloid	Bramley's Seedling, Idared	6[ ]
	oblong waisted	Gloster	7[ ]
5.4 (36)	**Fruit: relative area of over color of skin**		
	absent or very small	Granny Smith	1[ ]
	small	Auralia, Cox's Orange Pippin	3[ ]
	medium	Gala	5[ ]
	large	Spartan	7[ ]
	very large	Red Jonaprince	9[ ]

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

	Characteristics	Example Varieties	Note
5.5 (37)	**Fruit: hue of over color – with any bloom removed**		
	orange red	Cox's Orange Pippin, Egremont Russet	1[ ]
	pink red	Cripps Pink, Delorgue	2[ ]
	red	Akane, Galaxy, Red Elstar, Regal Prince	3[ ]
	purple red	Red Jonaprince, Spartan	4[ ]
	brown red	Fiesta, Joburn, Lord Burghley	5[ ]
5.6 (39)	**Fruit: pattern of over color of skin**		
	only solid flush	Red Jonaprince, Richared Delicious	1[ ]
	solid flush with weakly defined stripes	Galaxy	2[ ]
	solid flush with strongly defined stripes	Jonagored	3[ ]
	weakly defined flush with strongly defined stripes	Gravensteiner	4[ ]
	only stripes (no flush)	Helios	5[ ]
	flushed and mottled	Elstar	6[ ]
	flushed, striped and mottled	Jonagold	7[ ]
5.7 (40)	**Fruit: width of stripes**		
	narrow	Eden, Pinova, Pirella	3[ ]
	medium	Rubinola, Tenroy	5[ ]
	broad	Baigent, Caudle	7[ ]
5.8 (55)	**Time of beginning of flowering**		
	very early	Anna, Ein-Shemer	1[ ]
	early	Idared	3[ ]
	medium	Cox's Orange Pippin, Jonagold	5[ ]
	late	Court Pendu Plat	7[ ]
	very late	Feuillemorte, Spätblühender Taffetapfel	9[ ]

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

	Characteristics	Example Varieties	Note
5.9 (57)	**Time of eating maturity**		
	very early	Vista Bella	1[ ]
	very early to early	White Transparent	2[ ]
	early	Discovery, Jerseymac, Mountain Cove, Sunrise	3[ ]
	early to medium	Akane, James Grieve, Summerred	4[ ]
	medium	Elstar, Gala, Honeycrisp	5[ ]
	medium to late	Ambrosia, Spartan, Šampion	6[ ]
	late	Golden Delicious	7[ ]
	late to very late	Fuji	8[ ]
	very late	Cripps Pink, Granny Smith	9[ ]

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

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example:	*Fruit: pattern of over color of skin*	*solid flush with strongly defined stripes*	*only solid flush*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety should accompany the Technical Questionnaire.

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.

[#] 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:

9. Information on plant material to be examined.

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 or pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details of 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]