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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

APPLE ROOTSTOCK *

UPOV Code: MALUS

Malus Mill.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from South Africa

to be considered by the

Technical Working Party for Fruit Crops
at its forty-fifth session, to be held in Marrakesh, Morocco, from May 26 to 30, 2014

Disclaimer: this document does not represent UPOV policies or guidance

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Malus Mill.	Apple Rootstock	Porte-greffe de pommier	Apfel-Unterlagen	Portainjertos de 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.

* 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

These Test Guidelines apply to all rootstock varieties of *Malus* Mill..

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 one-year-old rooted trees, or in the form of one-year-old rooted plants (for stoolbeds).

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

5 one-year-old rooted trees and/or
10 one-year-old rooted plants for stoolbeds.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease. It should not be obtained directly from *in vitro* propagation.

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.

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.

3.4 Test Design

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

3.4.2 In the case of stoolbeds, each test should be designed to result in a total of at least 10 plants.

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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations should be made on 5 plants or parts taken from each of 5 plants for trees and 9 plants for stoolbeds disregarding any off-type plants. In the case of observations of parts of plants, the number of parts to be taken from each of the plants should be 2.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

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

4.2.2 In the case of trees, 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-type is allowed.

4.2.3 In the case of stoolbeds, 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 10 plants, one 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) Plant: vigor (characteristic 1)
(b) Plant: habit (characteristic 4)
(c) Young shoot: extent of anthocyanin coloration (characteristic 19)
(d) Leaf blade: attitude in relation to shoot (characteristic 20)
(e) Leaf blade: incisions of margin (characteristic 26)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

Example varieties for Asia, Europe and New Zealand are included as regional sets in an Annex to these Test Guidelines.

The example varieties provided for a particular region are not exclusive and might also be applicable in other regions.

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

MG, MS, VG, VS – see Chapter 4.1.5

A - Applies only for stoolbeds

B - Applies only for fully grown trees

(a)-(f) 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. **(*)** **(+)**	**VG**	**Plant: vigor**	**Plante : vigueur**	**Pflanze: Wuchsstärke**	**Planta: vigor**		
QN	**(a)**	very weak	très faible	sehr gering	muy débil	G 222	1
		weak	faible	gering	débil	M 26	2
		medium	moyenne	mittel	medio	M 7	3
		strong	forte	stark	fuerte	M 793	4
		very strong	très forte	sehr stark	muy fuerte	CG 934	5
2. **B**	**VG**	**Plant: number of branches**	**Plante : nombre de ramifications**	**Pflanze: Anzahl Zweige**	**Planta: número de ramas**		
QN	**(a)**	very few	très petit	sehr gering	muy bajo	G 222	1
		few	petit	gering	bajo	M 9	2
		medium	moyen	mittel	medio	M 26	3
		many	grand	groß	alto	G 202, G 707	4
		very many	très grand	sehr groß	muy alto	M 25	5
3. **A**	**VG**	**Plant: number of shoots**	**Plante : nombre de rameaux**	**Pflanze: Anzahl Triebe**	**Planta: número de ramillas**		
QN	**(a)**	very few	très petit	sehr gering	muy bajo		1
		few	petit	gering	bajo	M 9	2
		medium	moyen	mittel	medio	M 26	3
		many	grand	groß	alto	MM 111	4
		very many	très grand	sehr groß	muy alto	M 25	5
4. **(*)** **(+)**	**VG**	**Plant: habit**	**Plante : port**	**Pflanze: Haltung**	**Planta: hábito**		
PQ	**(a)**	upright	dressé	aufrecht	erguido	M 7	1
		upright to spreading	dressé à étalé	aufrecht bis breitwüchsig	erguido a extendido	G 707	2
		spreading	étalé	breitwüchsig	extendido	G 222	3
		drooping	retombant	hängend	colgante	Marubakaido	4
5. **B**	**VG**	**Plant: spines**	**Plante : épines**	**Pflanze: Dornen**	**Planta: espinas**		
QN	**(a)**	absent or few	absentes ou peu nombreuses	fehlend oder sehr wenige	ausente o bajo	M 9	1
		medium	moyennement nombreuses	mittel	medio	M 25	2
		many	nombreuses	viele	alto	G 202	3
6. **(*)** **(+)**	**VG**	**One-year-old shoot: growth pattern**	**Rameau d'un an : schéma de croissance**	**Einjähriger Trieb: Wuchsform**	**Ramilla de un año: patrón de crecimiento**		
QN	**(b)**	straight	droite	gerade	recta	M 9	1
		moderately wavy	moyennement ondulée	leicht gewellt	moderadamente ondulada	G 202, M 793	2
		strongly wavy	fortement ondulée	stark gewellt	muy ondulada	M 25	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7. (*) (+)	**VG**	**One-year-old shoot: pubescence**	**Rameau d'un an : pubescence**	**Einjähriger Trieb: Behaarung**	**Ramilla de un año: pubescencia**		
QN	**(b)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil		2
		medium	moyenne	mittel	media	M 793	3
		strong	forte	stark	fuerte	M 9	4
		very strong	très forte	sehr stark	muy fuerte	MM 106	5
8. (*)	**VG**	**One-year-old shoot: glossiness**	**Rameau d'un an : brillance**	**Einjähriger Trieb: Glanz**	**Ramilla de un año: brillo**		
QN	**(b)**	absent or weak	absente ou faible	fehlend oder gering	ausente o débil		1
		medium	moyenne	mittel	medio	G 202	3
		strong	forte	stark	fuerte	M 27	5
9. (*)	**VG/ MS**	**One-year-old shoot: thickness**	**Rameau d'un an : épaisseur**	**Einjähriger Trieb: Dicke**	**Ramilla de un año: grosor**		
QN	**(b)**	thin	mince	dünn	delgado	M 7	1
		medium	moyen	mittel	medio	MM 106	2
		thick	épais	dick	grueso		3
10. (*)	**VG/ MG**	**One-year-old shoot: length of internodes**	**Rameau d'un an : longueur des entre-nœuds**	**Einjähriger Trieb: Länge der Internodien**	**Ramilla de un año: longitud de los entrenudos**		
QN	**(b)**	short	courts	kurz	corta	M 25	1
		medium	moyens	mittel	media	M 26	2
		long	longs	lang	larga	G 707	3
11. (*)	**VG**	**One-year-old shoot: number of lenticels**	**Rameau d'un an : nombre de lenticelles**	**Einjähriger Trieb: Anzahl Lentizellen**	**Ramilla de un año: número de lenticelas**		
QN	**(b)**	very few	très petit	sehr gering	muy bajo		1
		few	petit	gering	bajo	M 9	2
		medium	moyen	mittel	medio	M 793	3
		many	grand	groß	alto	MM 111	4
		very many	très grand	sehr groß	muy alto		5
12.	**VG**	**One-year-old shoot: size of lenticels**	**Rameau d'un an : taille des lenticelles**	**Einjähriger Trieb: Größe der Lentizellen**	**Ramilla de un año: tamaño de las lenticelas**		
QN	**(b)**	small	petites	klein	pequeño		1
		medium	moyennes	mittel	medio	M 9	2
		large	grandes	groß	grande	MM 107	3
13. (*)	**VG**	**One-year-old shoot: color on sunny side**	**Rameau d'un an : couleur de la face exposée au soleil**	**Einjähriger Trieb: Farbe auf der Sonnenseite**	**Ramilla de un año: color de la parte soleada**		
PQ	**(b)**	greenish brown	brun verdâtre	grünlichbraun	marrón verdoso	M 9	1
		reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo	M 27	2
		medium brown	brun moyen	mittelbraun	marrón medio	M 25	3
		dark brown	brun foncé	dunkelbraun	marrón oscuro	M 26	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14. (*)	**VG**	**One-year-old shoot: size of vegetative bud**	**Rameau d'un an : taille du bourgeon à bois**	**Einjähriger Trieb: Größe der vegetativen Knospe**	**Ramilla de un año: tamaño de la yema de madera**		
QN	**(b)**	small	petit	klein	pequeño	M 25	1
		medium	moyen	mittel	medio	G 202	2
		large	grand	groß	grande	M 9	3
15. (+)	**VG**	**One-year-old shoot: shape of apex of vegetative bud**	**Rameau d'un an : forme du sommet du bourgeon à bois**	**Einjähriger Trieb: Form der Spitze der vegetativen Knospe**	**Ramilla de un año: forma del ápice de la yema de madera**		
PQ	**(b)**	acute	aigu	spitz	agudo	M 9	1
		obtuse	obtus	stumpf	obtuso	M 793	2
		rounded	arrondi	abgerundet	redondeado	M 7	3
16. A (+)	**VG**	**One-year-old shoot: position of vegetative bud in relation to shoot**	**Rameau d'un an : position du bourgeon à bois par rapport au rameau**	**Einjähriger Trieb: Stellung der Knospe im Verhältnis zum Trieb**	**Ramilla de un año: posición de la yema de madera en relación con la ramilla**		
QN	**(b)**	adpressed	appliqué	anliegend	adpresa	M 7	1
		slightly held out	légèrement divergent	leicht abstehend	ligeramente divergente	M 9	2
		strongly held out	fortement divergent	deutlich abstehend	muy divergente		3
17. (+)	**VG**	**One-year-old shoot: size of vegetative bud support**	**Rameau d'un an : taille du support du bourgeon à bois**	**Einjähriger Trieb: Größe des Wulstes der vegetativen Knospe**	**Ramilla de un año: tamaño del soporte de la yema de madera**		
QN	**(b)**	small	petit	klein	pequeño	M 9	1
		medium	moyen	mittel	medio	M 7	2
		large	grand	groß	grande	MM 106	3
18. (*) (+)	**VG**	**Young shoot: color of upper part**	**Jeune rameau : couleur de la partie supérieure**	**Einjähriger Trieb: Farbe der Oberseite**	**Ramilla joven: color de la parte superior**		
PQ	**(c)**	whitish	blanchâtre	weißlich	blanquecino		1
		greenish	verdâtre	grünlich	verdoso	MM 106	2
		reddish	rougeâtre	rötlich	rojizo	M 9	3
		blackish	noirâtre	schwärzlich	negruzco	M 26	4
19. (*)	**VG**	**Young shoot: extent of anthocyanin coloration**	**Jeune rameau : étendue de la pigmentation anthocyanique**	**Junger Trieb: Ausdehnung der Anthocyanfärbung**	**Ramilla joven: extensión de la pigmentación antociánica**		
QN	**(c)**	absent or very small	absente ou très faible	fehlend oder sehr gering	ausente o muy pequeña	M 27	1
		small	faible	gering	pequeña	G 222	2
		medium	moyenne	mittel	media	G 202	3
		large	forte	groß	grande	M 7	4
		very large	très forte	sehr groß	muy grande	Marubakaido	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20. (*) (+)	**VG**	**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 ramilla**		
QN	**(d)**	upwards	dressé	aufrecht	hacia arriba	M 793	1
		outwards	perpendiculaire	waagerecht	horizontal	G 707, M 7	2
		downwards	retombant	hängend	hacia abajo	G 778	3
21. (*)	**VG/ MS**	**Leaf blade: length**	**Limbe : longueur**	**Blattspreite: Länge**	**Limbo: longitud**		
QN	**(d)**	short	court	kurz	corta	M 26	3
		medium	moyen	mittel	media	M 793	5
		long	long	lang	larga	G 778	7
22. (*)	**VG/ MS**	**Leaf blade: width**	**Limbe : largeur**	**Blattspreite: Breite**	**Limbo: anchura**		
QN	**(d)**	narrow	étroit	schmal	estrecha	M 26	3
		medium	moyen	mittel	media	M 9	5
		broad	large	breit	ancha	G 778	7
23. (*)	**VG/ MS**	**Leaf blade: ratio length/width**	**Limbe : rapport longueur/largeur**	**Blattspreite: Verhältnis Länge/Breite**	**Limbo: relación entre la longitud y la anchura**		
QN	**(d)**	very low	très bas	sehr klein	muy pequeña	M 25	1
		low	bas	klein	pequeña	G 222, M 7	2
		medium	moyen	mittel	media	MM 111	3
		high	élevé	groß	grande	G 778	4
		very high	très élevé	sehr groß	muy grande	M 9	5
24. (*) (+)	**VG**	**Leaf blade: profile in cross section**	**Limbe : profil en section transversale**	**Blattspreite: Profil im Querschnitt**	**Limbo: perfil de la sección transversal**		
QN	**(d)**	concave	concave	konkav	cóncavo	G 778	1
		flat	plat	gerade	plano	G 707, M 7, M 9	2
		convex	convexe	konvex	convexo		3
25.	**VG**	**Leaf blade: length of tip**	**Limbe : longueur de la pointe**	**Blattspreite: Länge der Spitze**	**Limbo: longitud del extremo**		
QN	**(d)**	short	courte	kurz	corta	M 26	1
		medium	moyenne	mittel	media	G 202	2
		long	longue	lang	larga		3
26. (*) (+)	**VG**	**Leaf blade: incisions of margin**	**Limbe : incisions du bord**	**Blattspreite: Randeinschnitte**	**Limbo: incisiones del borde**		
PQ	**(d)**	crenate	crénelées	gekerbt	crenadas	G 707	1
		bicrenate	bicrénelées	doppelt gekerbt	bicrenadas	G 222, M 7, M 793	2
		serrate type 1	dentelées type 1	gesägt Typ 1	serradas tipo 1	MM 109	3
		serrate type 2	dentelées type 2	gesägt Typ 2	serradas tipo 2		4
		biserrate	bidentelées	doppelt gesägt	biserradas	G 778, MM 106	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.	**VG**	**Leaf blade: depth of incisions of margin**	**Limbe : profondeur des incisions du bord**	**Blattspreite: Tiefe der Randeinschnitte**	**Limbo: profundidad de las incisiones del margen**		
QN	**(d)**	very shallow	très peu profondes	sehr flach	muy poco profundas	M 26	1
		shallow	peu profondes	flach	poco profundas	CG 4204	2
		medium	moyennes	mittel	medias	G 707	3
		deep	profondes	tief	profundas	G 778	4
		very deep	très profondes	sehr tief	muy profundas		5
28. (*)	**VG**	**Leaf blade: undulation of margin**	**Limbe : ondulation du bord**	**Blattspreite: Randwellung**	**Limbo: ondulación del borde**		
QN	**(d)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	G 222, G 778	1
		weak	faible	gering	débil	M 9, MM 106	2
		medium	moyenne	mittel	media	Cepiland, M 7, M 26	3
		strong	forte	stark	fuerte	CG 6210	4
29.	**VG**	**Leaf blade: pubescence on lower side**	**Limbe : pubescence sur la face inférieure**	**Blattspreite: Behaarung der Unterseite**	**Limbo: pubescencia del envés**		
QN	**(d)**	weak	faible	gering	débil	M 9	1
		medium	moyenne	mittel	media	M 27	2
		strong	forte	stark	fuerte	MM 106	3
30. (*)	**VG**	**Leaf blade: glossiness of upper side**	**Limbe : brillance de la face supérieure**	**Blattspreite: Glanz der Oberseite**	**Limbo: brillo en el haz**		
QN	**(d)**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	M 26	1
		weak	faible	gering	débil	MM 106	2
		medium	moyenne	mittel	medio	M 9	3
		strong	forte	stark	fuerte	CG 4202, Marubakaido	4
31. (*)	**VG**	**Leaf blade: intensity of green color**	**Limbe : intensité de la couleur verte**	**Blattspreite: Intensität der Grünfärbung**	**Limbo: intensidad del color verde**		
QN	**(d)**	light	claire	hell	clara	G 778, M 7	1
		medium	moyenne	mittel	media	G 707, M 9	3
		dark	foncée	dunkel	oscura	M 26, MM 109	5
32. (*)	**VG/ MS**	**Petiole: length**	**Pétiole : longueur**	**Blattstiel: Länge**	**Pecíolo: longitud**		
QN	**(d)**	short	court	kurz	corta	M 26	1
		medium	moyen	mittel	media	M 9	3
		long	long	lang	larga	G 707	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33. (*) (+)	**VG/ MS**	**Leaf: length of petiole relative to length of blade**	**Feuille : rapport longueur du pétiole/ longueur du limbe**	**Blatt: Länge des Blattstiels im Verhältnis zur Länge der Blattspreite**	**Hoja: longitud del pecíolo en relación con la longitud del limbo**		
QN	**(d)**	short	court	kurz	corta	M 7	1
		medium	moyen	mittel	media	G 202	3
		long	long	lang	larga	G 778	5
34. (+)	**VG**	**Petiole: extent of anthocyanin coloration**	**Pétiole : étendue de la pigmentation anthocyanique**	**Blattstiel: Ausbreitung der Anthocyanfärbung**	**Pecíolo: extensión de la pigmentación antociánica**		
QN	**(d)**	small	faible	gering	pequeña	G 222	1
		medium	moyenne	mittel	media	G 778	2
		large	forte	groß	grande	Marubakaido	3
35. (*)	**VG**	**Stipule: size**	**Stipule : taille**	**Nebenblatt: Größe**	**Estípula: tamaño**		
QN	**(d)**	small	petit	klein	pequeño	M 27	1
		medium	moyen	mittel	medio	M 9	2
		large	grand	groß	grande	MM 106	3
36. B (+)	**VG**	**Plant: number of flowers**	**Plante : nombre de fleurs**	**Pflanze: Anzahl Blüten**	**Planta: número de flores**		
QN	**(e)**	absent or few	absentes ou peu nombreuses	fehlend oder gering	ausentes o bajo	Marubakaido	1
		medium	moyennement nombreuses	mittel	medio	M 7	2
		many	nombreuses	groß	alto	G 707	3
37. B (+)	**VG**	**Flower: color at balloon stage**	**Fleur : couleur au stade ballon**	**Blüte: Farbe im Ballonstadium**	**Flor: color en la fase de capullo**		
PQ	**(e)**	light pink	rose pâle	hellrosa	rosa claro	M 7	1
		medium pink	rose moyen	mittelrosa	rosa medio	M 9	2
		medium red	rouge moyen	mittelrot	rojo medio	G 707	3
		dark red	rouge foncé	dunkelrot	rojo oscuro	G 228	4
		purple	pourpre	purpurn	púrpura		5
38. B (+)	**VG**	**Flower: arrangement of petals**	**Fleur : disposition des pétales**	**Blüte: Anordnung der Blütenblätter**	**Flor: disposición de los pétalos**		
QN	**(e)**	free	disjoints	freistehend	libres	Cepiland, M 9	1
		intermediate	intermédiaires	mittel	intermedios	M 7	2
		overlapping	se recouvrant	überlappend	solapados	G 222	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. **B** **(+)**	**VG**	**Flower: diameter**	**Fleur : diamètre**	**Blüte: Durchmesser**	**Flor: diámetro**		
QN	**(e)**	very small	très petit	sehr klein	muy pequeño	G 228	1
		small	petit	klein	pequeño	M 793	2
		medium	moyen	mittel	medio	G 707	3
		large	grand	groß	grande	M 27	4
40. **B** **(+)**	**VG**	**Flower: position of stigmas relative to anthers**	**Fleur : position des stigmates par rapport aux anthères**	**Blüte: Stellung der Narben im Vergleich zu den Antheren**	**Flor: posición de los estigmas en relación con las anteras**		
QN	**(e)**	below	au-dessous	unterhalb	por debajo		1
		same level	au même niveau	auf gleicher Höhe	al mismo nivel	M 7	2
		above	au-dessus	oberhalb	por encima	G 228, M 793	3
41. **B**	**VG**	**Fruit: size**	**Fruit : taille**	**Frucht: Größe**	**Fruto: tamaño**		
QN	**(f)**	very small	très petit	sehr klein	muy pequeño		1
		small	petit	klein	pequeño	G 222	3
		medium	moyen	mittel	medio	M 7, M 793	5
		large	gros	groß	grande	MM 109	7
		very large	très gros	sehr groß	muy grande		9
42. **B**	**VG**	**Fruit: ratio length/ width**	**Fruit : rapport longueur/largeur**	**Frucht: Verhältnis Länge/Breite**	**Fruto: relación entre la longitud y la anchura**		
QN	**(f)**	very low	très bas	sehr klein	muy pequeña	M 793	1
		low	bas	klein	pequeña	M 26	2
		medium	moyen	mittel	media	M 7	3
		high	élevé	groß	grande	G 222	4
43. **B** **(+)**	**VG**	**Fruit: shape**	**Fruit : forme**	**Frucht: Form**	**Fruto: forma**		
PQ	**(f)**	conic waisted	conique étranglé	kegelförmig tailliert	cónica entallada		1
		conic	conique	kegelförmig	cónica		2
		ovate	ovale	eiförmig	oval		3
		oblate	aplati	breitrund	achatada	M 793	4
		circular	circulaire	rundlich	circular		5
		elliptic	elliptique	elliptisch	elíptica		6
		oblong	oblong	rechteckig	oblonga		7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44. **B**	**VG**	**Fruit: ribbing**	**Fruit : côtes**	**Frucht: Rippung**	**Fruto: acostillado**		
QN	**(f)**	absent or very weak	absentes ou très faibles	fehlend oder sehr gering	ausente o muy débil	G 778	1
		weak	faibles	gering	débil	G 228	2
		medium	moyennes	mittel	medio		3
		strong	fortes	stark	fuerte	G 222	4
45. **B**	**VG**	**Fruit: crowning at calyx end**	**Fruit : couronnement au sommet du calice**	**Frucht: Wülste oder Höcker am Kelchende**	**Fruto: remate del extremo del cáliz**		
QN	**(f)**	absent or very weak	absent ou très faible	fehlend oder gering	ausente o muy débil	G 707	1
		weak	faible	gering	débil	G 228	2
		medium	moyen	mittel	medio	MM 106	3
		strong	fort	stark	fuerte	G 222	4
46. **B**	**VG**	**Fruit: ground color**	**Fruit : couleur de fond**	**Frucht: Grundfarbe**	**Fruto: color de fondo**		
PQ	**(f)**	not visible	non visible	nicht sichtbar	no visible		1
		whitish yellow	jaune blanchâtre	weißlichgelb	amarillo blanquecino	G 778	2
		yellow	jaune	gelb	amarillo	M 9	3
		whitish green	vert blanchâtre	weißlichgrün	verde blanquecino	G 228	4
		yellow green	vert jaune	gelbgrün	verde amarillento	M 793	5
		green	vert	grün	verde		6
47. **B** **(+)**	**VG**	**Fruit: over color**	**Fruit : couleur du lavis**	**Frucht: Deckfarbe**	**Fruto: color superior**		
PQ	**(f)**	orange red	rouge orangé	orangerot	rojo anaranjado		1
		pink red	rouge-rose	rosarot	rojo rosado	G 228	2
		red	rouge	rot	rojo	G 222, G 707	3
		purple red	rouge-pourpre	purpurnrot	rojo púrpura		4
		brown red	rouge-brun	braunrot	rojo amarronado		5
48. **B**	**VG**	**Fruit: relative area of over color**	**Fruit : proportion de lavis**	**Frucht: Anteil der Deckfarbe**	**Fruto: zona relativa del color superior**		
QN	**(f)**	absent or very small	nulle ou très petite	fehlend oder sehr klein	ausente o muy pequeña	MM 109	1
		small	petite	klein	pequeña	G 228	3
		medium	moyenne	mittel	media	G 707	5
		large	grande	groß	grande	M 793	7
		very large	très grande	sehr groß	muy grande		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. **B**	**VG**	**Fruit: length of stalk**	**Fruit : longueur du pédoncule**	**Frucht: Länge des Stieles**	**Fruto: longitud del pedúnculo**		
QN	**(f)**	very short	très court	sehr kurz	muy corto	M 793	1
		short	court	kurz	corto	G 778	3
		medium	moyen	mittel	medio	MM 109	5
		long	long	lang	largo	G 228	7
		very long	très long	sehr lang	muy largo	G 707	9
50. **B** **(+)**	**VG**	**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 lóculos en la sección transversal**		
QN	**(f)**	closed or slightly open	fermées ou légèrement ouvertes	geschlossen oder leicht offen	cerrados o ligeramente abiertos	M 7	1
		moderately open	modérément ouvertes	leicht offen	moderadamente abiertos	G 228	2
		fully open	complètement ouvertes	vollständig offen	completamente abiertos	MM 109	3
51. **(*)** **(+)**	**MG**	**Time of beginning of bud burst**	**Époque de début du débourrement**	**Zeitpunkt des Beginns des Knospenaufbruchs**	**Época de inicio de la apertura de yemas**		
QN		very early	très précoce	sehr früh	muy temprana	G 202	1
		early	précoce	früh	temprana	M 9	3
		medium	moyenne	mittel	media	M 25	5
		late	tardive	spät	tardía	MM 111	7
		very late	très tardive	sehr spät	muy tardía	M 26	9
52. **B** **(+)**	**MG**	**Time of beginning of flowering**	**Époque de début de la floraison**	**Zeitpunkt des Blühbeginns**	**Época de comienzo de la floración**		
QN		very early	très précoce	sehr früh	muy temprana	G 202	1
		early	précoce	früh	temprana	G 707	3
		medium	moyenne	mittel	media	M 25	5
		late	tardive	spät	tardía	M 7, MM 111	7
		very late	très tardive	sehr spät	muy tardía	M 26	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) Plant: Observations on the plant should be made in the dormant season.

(b) One-year-old shoot: Observations on the shoot should be made on the middle third of the one-year-old shoot in the dormant season.

(c) Young shoot: Observation of the young shoot should be made on the upper third of the one-year-old shoot during rapid growth.

(d) Leaf: Observations on the leave should be made on fully developed leaves from the middle third of vigorous current season shoots.

(e) Flower: Observations on the flower should be done on fully grown trees. Observations on the flower should be made on the second or subsequent flowers, at the start of dehiscence.

(f) Fruit: Observations on the fruit should be done on fully grown trees. All observations of the fruit should be made on 10 typical fruits taken from a minimum sample of 20 fruits, at time of visual ripeness.

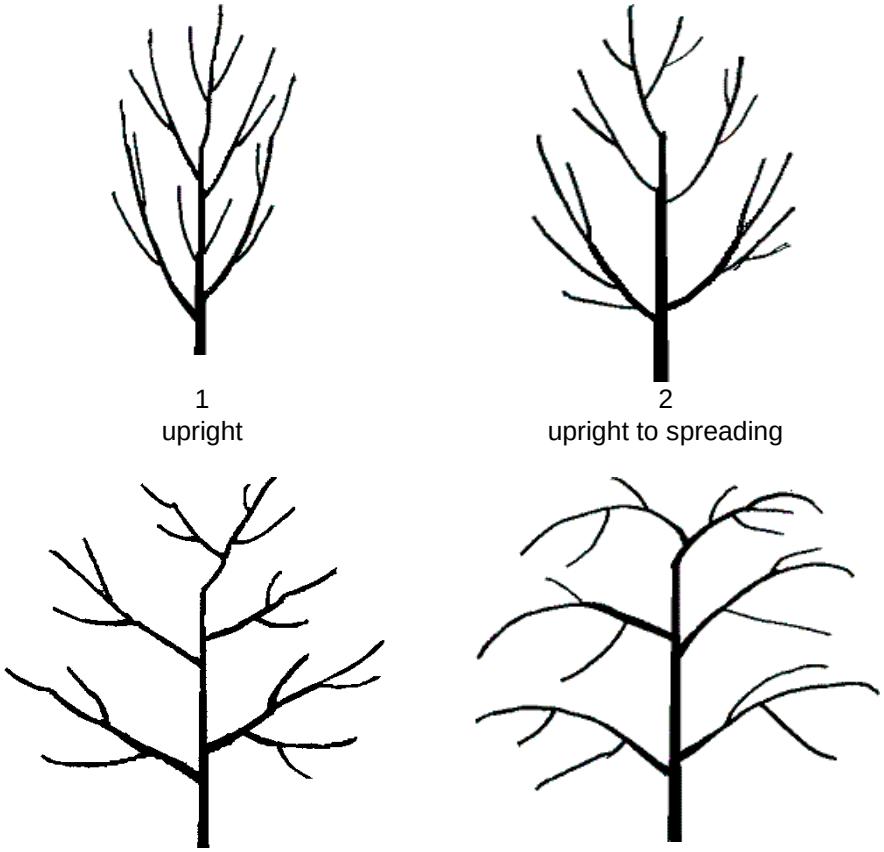
8.2 Explanations for individual characteristics

Ad. 1: Plant: vigor

The vigor of the plant should be considered as the overall abundance of vegetative growth.

Ad. 4: Plant: habit

Only applies to B



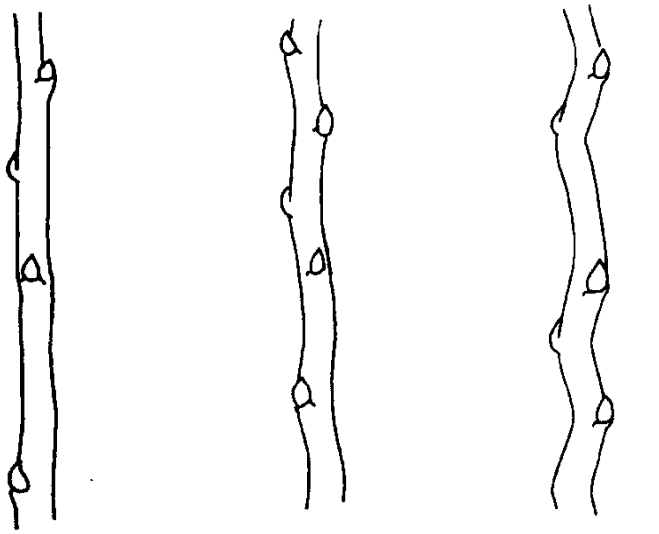
1
upright

2
upright to spreading

3
spreading

4
drooping

Ad. 6: One-year-old shoot: growth pattern



1
straight

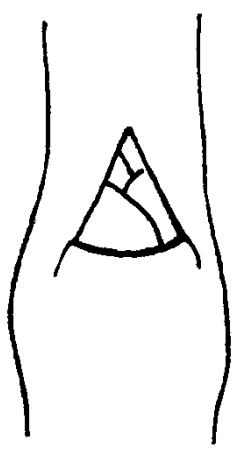
2
moderately wavy

3
strongly wavy

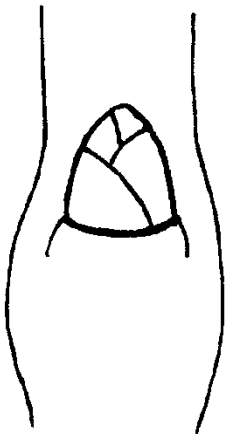
Ad. 7: One-year-old shoot: pubescence

The pubescence should be observed on the distal half of the shoot.

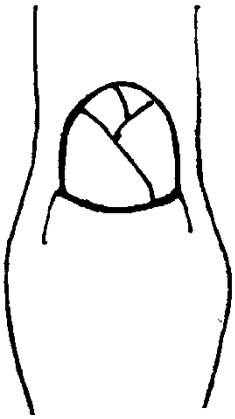
Ad. 15: One-year-old shoot: shape of apex of vegetative bud



1
acute

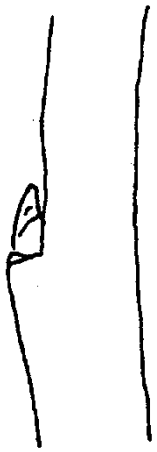


2
obtuse



3
rounded

Ad. 16: One-year-old shoot: position of vegetative bud in relation to shoot

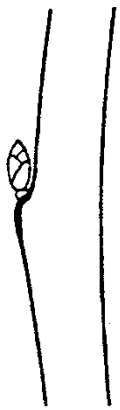


1
adpressed

2
slightly held out

3
strongly held out

Ad. 17: One-year-old shoot: size of vegetative bud support



1
small

2
medium

3
large

Ad. 18: Young shoot: color of upper part

The color observed should be of the underlying skin underneath the pubescence.

Ad. 20: Leaf blade: attitude in relation to shoot

1
upwards

2
outwards

3
downwards

Ad. 24: Leaf blade: profile in cross section

1
concave

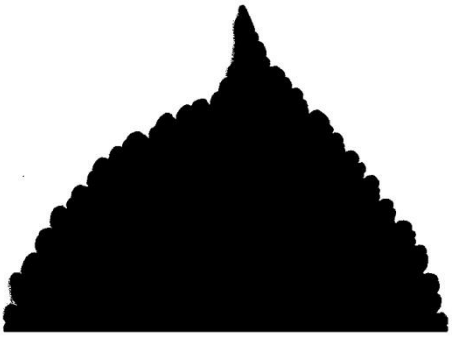
2
flat

3
convex

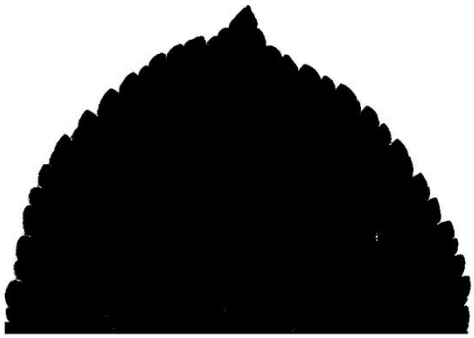
Ad. 26: Leaf blade: incisions of margin

Observations should be done on the upper half of the leaf blade.

1
crenate

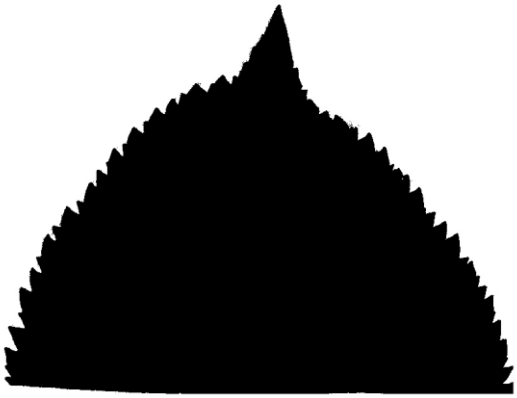


2
bicrenate



3
serrate type 1

4
serrate type 2



5
biserrate

Ad. 33: Leaf: length of petiole relative to length of blade

Should be assessed regarding the length of the petiole compared to the length of the middle vein of the leaf.

Ad. 34: Petiole: extent of anthocyanin coloration

Should be assessed regarding the degree to which the amount of anthocyanin coloration extends from the petiole base towards the base of the leaf.

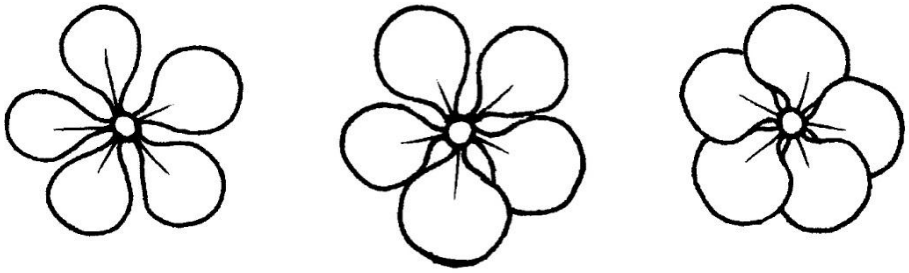
Ad. 36: Plant: number of flowers

Should be assessed as the amount of flowers present during the flowering period.

Ad. 37: Flower: color at balloon stage

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

Ad. 38: Flower: arrangement of petals

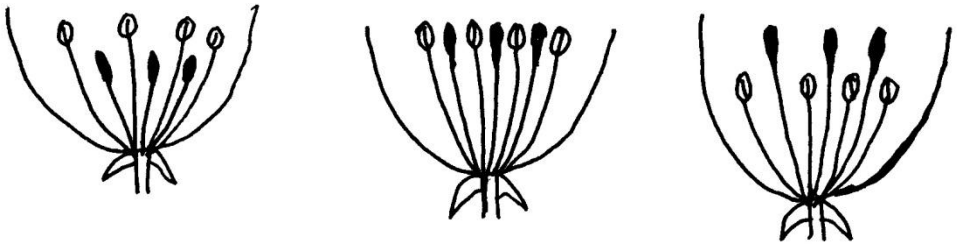


1	2	3
free	intermediate	overlapping

Ad. 39: Flower: diameter

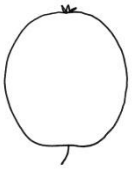
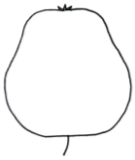
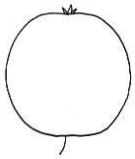
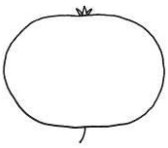
The observation should be done with the petals pressed into a horizontal position.

Ad. 40: Flower: position of stigmas relative to anthers



1	2	3
below	same level	above

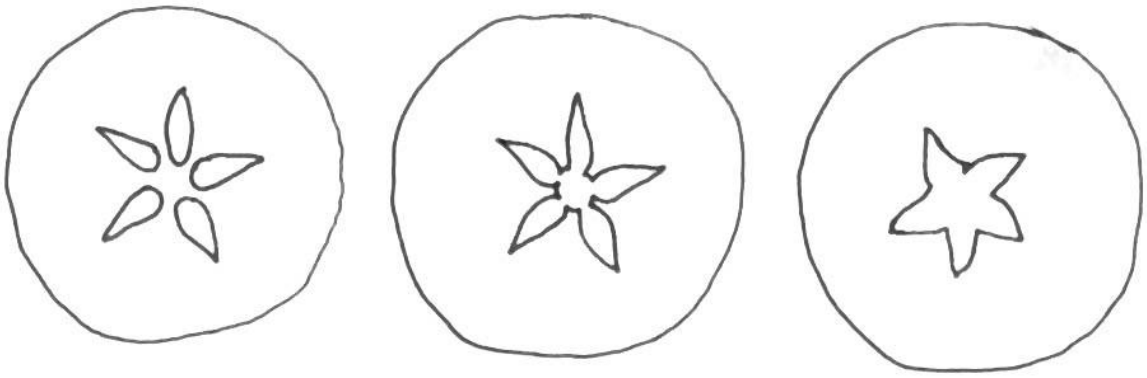
Ad. 43: Fruit: shape

width (ratio length/width)	← broadest part →	
	below middle	at middle
narrow (high) →		 7 oblong
	 3 ovate	 6 elliptic
	 1 conic waisted	 2 conic	 5 circular
broad (low) ←		 4 oblate

Ad. 47: Fruit: over color

All observation should be done with the bloom removed.

Ad. 50: Fruit: aperture of locules in transverse section



1	2	3
closed or slightly open	moderately open	fully open

Ad. 51: Time of beginning of bud burst

The time of beginning of bud burst is when 10% of the buds show green points.

Ad. 52: Time of beginning of flowering

The time of beginning of flowering is when 10% of the flowers on the 5 trees are fully open.

9. Literature

Embree, C.G. 1995: "A Photographic Description of the Fruit of Certain Apple Rootstocks," Fruit Varieties Journal, 49 (1):59-64, US

Ferree, David C., Carlson, Robert F., 1987: "Apple Rootstocks" in Rootstocks for Fruit Crops, Ed. Rom, Roy C. and Carlson, Robert F., Wiley, 107-143, US

Krümmel, H., 1956: "Die vegetativ vermehrbaren Unterlagen des Kern- und Steinobstes," Berlin: Deutscher Bauernverlag, DE

Maurer, Erich.,1939: "Die Unterlagen der Obstgehölze," Berlin: Parey Verlag, DE

Simons, Roy K., 1986: "Leaf Characteristics of Apple Dwarfing Rootstocks," Fruit Varieties Journal, 40 (3): 71-79, US

Tydeman, H.M., 1953: "A Description of Classification of the Malling-Merton and Malling XXV Apple Rootstocks," Report East Malling Research Station for 1952, pp. 53-63, GB

Tydeman, H.M., 1954: "A Description of Certain MIX Crosses," Report East Malling Research Station for 1953, GB

Tydeman, H.M., 1955: "Descriptions of the Malling Apple Rootstocks," Report East Malling Research Station for 1954, pp. 64-66, GB

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 Genus	
1.1.1 Botanical name	*Malus* Mill.
1.1.2 Common name (please complete)	Apple Rootstocks
1.2 Species	
1.2.1 Botanical name (please complete)	
1.2.2 Common name	

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……) x (……..……..……..…)
female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……...…) x (……..……..……..…)
female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(please provide details)

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

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

4.2 Method of propagating the variety

4.2.1 Vegetative propagation

(a) cuttings [ ]

(b) *in vitro* propagation [ ]

(c) other (state method) [ ]

4.2.2 Other [ ]
(please provide details)

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

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: vigor**		
	very weak	G 222	1[ ]
	weak	M 26	2[ ]
	medium	M 7	3[ ]
	strong	M 793	4[ ]
	very strong	CG 934	5[ ]
5.2 (3)	**Plant: number of shoots**		
(A)	very few		1[ ]
	few	M 9	2[ ]
	medium	M 26	3[ ]
	many	MM 111	4[ ]
	very many	M 25	5[ ]
5.3 (4)	**Plant: habit**		
	upright	M 7	1[ ]
	upright to spreading	G 707	2[ ]
	spreading	G 222	3[ ]
	drooping	Marubakaido	4[ ]
5.4 (6)	**One-year-old- shoot: growth pattern**		
	straight	M 9	1[ ]
	moderately wavy	G 202, M 793	2[ ]
	strongly wavy	M 25	3[ ]
5.5 (19)	**Young shoot: extent of anthocyanin coloration**		
	absent or very small	M 27	1[ ]
	small	G 222	2[ ]
	medium	G 202	3[ ]
	large	M 7	4[ ]
	very strong	Marubakaido	5[ ]

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

	Characteristics	Example Varieties	Note
5.6 (20)	**Leaf blade: attitude in relation to shoot**		
	upwards	M 793	1[ ]
	outwards	G 707, M 7	2[ ]
	downwards	G 778	3[ ]
5.7 (26)	**Leaf blade: incisions of margin**		
	crenate	G 707	1[ ]
	bicrenate	G 222, M 7, M 793	2[ ]
	serrate type 1	MM 109	3[ ]
	serrate type 2		4[ ]
	biserrate	G 778, MM 106	5[ ]
5.8 (51)	**Time of beginning of bud burst**		
	very early	G202	1[ ]
	very early to early		2[ ]
	early	M 9	3[ ]
	early to medium		4[ ]
	medium	M 25	5[ ]
	medium to late		6[ ]
	late	MM 111	7[ ]
	late to very late		8[ ]
	very late	M 26	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	*Plant: vigor*	*weak*	*strong*

Comments:

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

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

7.1 Resistance to pests and diseases

7.2 Special conditions for the examination of the variety

7.3 Virus status

(a) The variety is free from all known viruses as follows: [ ]
(indicate from which viruses)

.....

(b) The plant material is virus tested [ ]
(indicate against which viruses)

.....

(c) The virus status is unknown [ ]

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 or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

……

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ]

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature

Date

11. Annex : Regional Sets of Example Varieties

1. New Zealand

Characteristic	Cepiland	CG 934	G 202	M 116	M 25	M 26	M 27	M 9	MM 106	JM7
1.		5	3			2	2	2	4	3
2.			4		5	3	1	2	4	
4.	3			1						
5.			3							
6.			2					1		
7.								4		
8.			3				5			1
9.									4	
10.				2			1			
11.								2		
12.			2							
13.							2	1		2
14.			2				2	3	1	
15.				3						1
16.								2	1	
17.								1	3	
18.				1				3	2	
20.			2	1					2	3
24.				1				2		
25.			2	1						
32.										3
33.			3							
37										1
38										3
41.			3						9	1
43										5
46.								3	3	
48.				3						1
51.			1							

2. Asia

			Variety								
Characteristic	**B 9**	**CG 6210**	**CG 4202**	**G 222**	**G 778**	**M 26**	**M 27**	**M 7**	**M 9**	**Marubakaido**	**MM 106**
25.							1		2		
28.		4		1	1	3		3	2		
30.			4			1			3	4	2
37.	5						1	1	2		
38.							3	2	1		

3. Europe

Characteristic	B 9	Bemali	Cepiland	CG 24	CG 80	CG 10	G 202	Joha	J-TE-A	J-TE-B	J-TE-F	J-TE-G	J-TE-H	J 9	Lizzy	Lancep	Last Minute	M 27	M 26	M 18	M 16	M11
1	3										2		3									
3								3								3	3					
4																						
6																			2			
7	2							4										3				
8																			3			
9	2														3							
10													1				2					
11						4					2					2			3			
12	2							2			1				2							
13	4												3		2			3	3			
14													1						2			
15						1							1				2					
16			3																			
17																	2					
20																		1				
21	7																	3	3			
22																		5				
23																	3	2				
24																		1				
25																	3		1			
26									4			2	3	1								
28			3	4									3							4		
29															2							
30																					1	
31				3		5						1							5			

Characteristic	M 9	M 8	M 7	M 5	M 4	M 3	M 2	M 1	Mark	MM 102	MM 104	MM 105	MM 106	MM 111	MM 112	MM 114	MM 115	Pi 80	P 47	P 1	P 16	P 92	SU57233	Supporter 1
1																								
3																								3
4	3																							
6	1								2															2
7	4																							
8																								
9									2															
10																								
11				3			4		3															3
12																								
13					1		4		2															
14	3																							
15			3						2															2
16					3		3																	
17			2				3		3															
20																								
21	7																							
22																								
23			2																					3
24	2		2																					
25													2								3			
26	3														5	5								
28												1	2					1						
29			1																					2
30	4									4			3	2	4	1								
31	3																							

Characteristic	B 9	Bemali	Cepiland	CG 24	CG 80	CG 10	G 202	Joha	J-TE-A	J-TE-B	J-TE-F	J-TE-G	J-TE-H	J 9	Lizzy	Lancep	Last Minute	M 27	M 26	M 18	M 16	M11	M 9	M 8	M 7	M 5	M 4	M 3	M 2	M 1	Mark	MM 102	MM 104	MM 105	MM 106	MM 111	MM 112	MM 114	MM 115	Pi 80	P 47	P 1	P 16	P 92	SU5233	Supporter 1
32																		1					3												5											
34						3					1												2																							
35																		1					2												3											
37	4				1						2			5																															3
38			1							3																																			
40										3																																	2		
41											3		5										7																							
43		5															3					6																							
44		1		2	3											4																													
45					4			3	2																			1																	
46	1			4																			2		6				5												3		
47																			1												5	4								2				
48	9																		7														5	3					1					
49																	1																								5		3	7	9
50											3						2									1																			
51	5		5														7		9								3																		

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