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<p>PINEAPPLE</p> <p>UPOV Code: ANANA_COM</p> <p><i>Ananas comosus</i> (L.) Merr.</p>

GUIDELINES
FOR THE CONDUCT OF TESTS
FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Ananas comosus</i> (L.) Merr.	Pineapple	Ananas	Ananas	Piña

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 varieties of *Ananas comosus* (L.) Merr.. The characteristics in these Test Guidelines have been developed to distinguish between edible varieties and additional characteristics may be needed in order to examine ornamental varieties.

In the case of ornamental varieties, in particular, it may be necessary to use additional characteristics or additional states of expression to those included in the Table of Characteristics in order to examine Distinctness, Uniformity and Stability.

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 aerial suckers, crowns, slips or young plants as specified by the authority.

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

10 aerial suckers, crowns, slips or young plants.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 *Number of Growing Cycles*

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

3.1.2 The growing cycle is considered to be the period ranging from the beginning of active vegetative growth continuing through active vegetative growth and fruit development and concluding with the harvesting of fruit.

3.2 *Testing Place*

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness".

3.3 *Conditions for Conducting the Examination*

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.1.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 10 plants.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 *Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 2.

4.1.5 Method of Observation

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

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

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

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective

observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

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

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

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

4.2 *Uniformity*

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 *Stability*

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Plant: growth habit (characteristic 1)
- (b) Leaf: anthocyanin coloration (characteristic 6)
- (c) Leaf: piping (characteristic 8)
- (d) Leaf: spines (characteristic 9)
- (e) Fruit: shape (characteristic 31)
- (f) Fruit: predominant color (characteristic 34)
- (g) Fruit: color of flesh (characteristic 39)

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.

See Chapter 8.3 for a list of synonyms of example varieties.

6.5 *Legend*

(*) Asterisk 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)-(d) See Explanations on the Table of Characteristics in Chapter 8.1

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

1-T, 2-A, 3-I, 4-M See Explanations on the Table of Characteristics in Chapter 8.1 (growth stages)

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: growth habit	Plante : port	Pflanze: Wuchsform	Planta: porte		
(*)							
(+)	1-T						
QN	(a)	upright	dressé	aufrecht	erguido	Perola	1
		semi upright	demi-dressé	halbaufrecht	semierguido	Smooth Cayenne	3
		spreading	étalé	breitwüchsig	extendido	Perolera	5
2.	VG/ MS	Plant: number of leaves	Plante : nombre de feuilles	Pflanze: Anzahl der Blätter	Planta: número de hojas		
(*)							
(+)	1-T						
QN	(a)	few	faible	gering	bajo	Perola	3
		medium	moyen	mittel	medio	BRS Imperial, Gold, Smooth Cayenne	5
		many	élevé	groß	alto	Gomo de Mel	7
3.	VG/ MS	Leaf: length	Feuille : longueur	Blatt: Länge	Hoja: longitud		
(*)							
(+)	1-T						
QN	(a)	short	petite	kurz	corta	Queen	3
		medium	moyenne	mittel	media	Smooth Cayenne	5
		long	grande	lang	larga	Aus-Carnival, Perola	7
4.	VG/ MS	Leaf: width	Feuille : largeur	Blatt: Breite	Hoja: anchura		
(*)							
(+)	1-T						
QN	(a)	narrow	étroite	schmal	estrecha	Queen	3
		medium	moyenne	mittel	media	Smooth Cayenne	5
		broad	large	breit	ancha	Perola	7
5.	VG	Leaf: green color of upper side	Feuille : couleur verte de la face supérieure	Blatt: Grünfärbung der Oberseite	Hoja: verde color del haz		
(*)							
	1-T						
QN	(a)	light	claire	hell	claro	BRS Vitoria	3
		medium	moyenne	mittel	medio	Smooth Cayenne	5
		dark	foncée	dunkel	oscuro	Jupi, MD-2, Perola	7
6.	VG	Leaf: anthocyanin coloration	Feuille : pigmentation anthocyanique	Blatt: Anthocyanfärbung	Hoja: pigmentación antociánica		
(*)							
	1-T						
QN	(a)	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Aus-Jubilee, BRS Vitoria, MD-2, Selangor Green	1
		weak	faible	gering	débil	Pot à eau	3
		medium	moyenne	mittel	media	Smooth Cayenne	5
		strong	forte	stark	fuerte	Rondon	7
		very strong	très forte	sehr stark	muy fuerte	Roxo de Tefe, 73-50	9

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
7.	VG	Leaf: trichomes on lower side	Feuille : trichomes sur la face inférieure	Blatt: Trichome auf der Unterseite	Hoja: tricomas en el envés	
(+)	1-T					
QN	(a)	absent or very sparse	absente ou peu dense	fehlend oder gering	ausentes o muy escasos	1
		intermediate	intermédiaire	mittel	medios	Smooth Cayenne
		dense	dense	hoch	densos	Queen
8.	VG	Leaf: piping	Feuille : piping	Blatt: Paspelierung	Hoja: piping	
(*)	1-T					
(+)						
QL	(a)	absent	absent	fehlend	ausente	Queen, Samba
		present	présent	vorhanden	presente	Perolera, Singapore Canning
9.	VG	Leaf: spines	Feuille : épines	Blatt: Stacheln	Hoja: espinas	
(+)	1-T					
QL	(a)	absent	absentes	fehlend	ausentes	BRS Imperial, Perolera, Samba, Singapore Canning
		present	présentes	vorhanden	presentes	Queen
10.	VG	Leaf: density of spines	Feuille : densité des épines	Blatt: Dichte der Stacheln	Hoja: densidad de espinas	
	1-T					
QN	(a)	sparse	peu dense	gering	dispersas	MD-2, Smooth Cayenne
		medium	moyenne	mittel	medias	Red Spanish, Tainon 17
		dense	dense	hoch	densas	Abacaxi special amarelo, Perola, Queen, Tainon 4
11.	VG	Leaf: position of spines on margin	Feuille : position des épines au bord	Blatt: Position der Stacheln am Rand	Hoja: posición de las espinas en el borde	
(+)	1-T					
PQ	(a)	at base only	à la base seulement	nur an der Basis	sólo en la base	1
		at apex only	au sommet seulement	nur an der Spitze	sólo en el ápice	Smooth Cayenne
		at base and apex	à la base et au sommet	an Basis und Spitze	en la base y en el ápice	MD-2
		along all margin	le long de tout le bord	am gesamten Rand	en todo el borde	Queen
12.	VG	Leaf: color of spines	Feuille : couleur des épines	Blatt: Farbe der Stacheln	Hoja: color de las espinas	
	1-T					
PQ	(a)	yellowish green	vert jaunâtre	gelblich grün	verde amarillento	Gold, MD-2
		orange	orange	orange	naranja	2
		red	rouge	rot	rojo	Gomo de Mel
		purple	violet	purpur	púrpura	4
13.	VG	Leaf : size of spines	Feuille : taille des épines	Blatt: Größe der Stacheln	Hoja : tamaño de las espinas	
(*)	1-T					
QN	(a)	small	petite	klein	pequeño	Gold, MD-2, Perola, Smooth Cayenne
		medium	moyenne	mittel	media	Singapore Canning
		large	grande	groß	grande	Gomo de Mel, Queen

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
14.	VG (*) (+) 2-A	Inflorescence: size of bracts	Inflorescence : taille de la bractée	Blütenstand: Bracteengröße	Inflorescencia: tamaño de la bráctea		
QN	(b)	small	petite	klein	pequeño	Perola	1
		medium	moyenne	mittel	medio	Queen, Smooth Cayenne	2
		large	grande	groß	grande	Singapore Canning	3
15.	VG 2-A	Petal : color of apex	Pétale : couleur du sommet	Blütenblatt: Farbe der Spitze	Pétalo: color del ápice		
QL	(b)	blue purple	pourpre bleu	blaupurpurn	púpura azulado	Perola	1
		purple red	rouge pourpre	purpurrot	rojo púpura	Smooth Cayenne	2
16.	VG/MS 2-A	Petal length	Pétale : longueur	Blütenblatt: Länge	Pétalo longitud		
QN	(b)	short	court	kurz	corto	Singapore Canning	1
		medium	moyen	mittel	medio	Smooth Cayenne	2
		long	long	lang	largo	Rondon	3
17.	VG 2-A	Stamen: length	Étamines : longueur	Staubblatt: Länge	Estambre: longitud		
QN	(b)	short	courtes	kurz	corto	Smooth Cayenne	1
		medium	moyennes	mittel	medio	Rondon	2
		long	longues	lang	largo	Perolera	3
18.	VG 2-A	Style: length	Style : longueur	Griffel: Länge	Estilo: longitud		
QN	(b)	short	court	kurz	corto	Singapore Canning	1
		medium	moyen	mittel	medio	Red Spanish	2
		long	long	lang	largo	Perolera	3
19.	VG 3-I	Immature fruit: color	Fruit immature : couleur	Unreife Frucht: Farbe	Fruto no maduro: color		
PQ	(c)	grey	gris	grau	gris	Perola	1
		medium green	vert moyen	mittelgrün	verde medio	Smooth Cayenne	2
		dark green	vert foncé	dunkelgrün	verde oscuro	MD-2	3
		pink	rose	rosa	rosa		4
		red	rouge	rot	rojo		5
		purple	pourpre	purpurn	púpura		6
		brownish purple	pourpre brunâtre	bräunlichpurpurn	púpura amarronado	Roxo de Tefe	7
		dark brown	brun foncé	dunkelbraun	marrón oscuro		8

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota	
20.	VG 4-M	Plant: height to fruit base	Plante : hauteur jusqu'à la base du fruit	Pflanze: Höhe bis zur Fruchtbasis	Planta: altura hasta la base del fruto		
QN	(d)	low	faible	niedrig	baja	Queen, Rondon	3
		medium	moyenne	mittel	media	BRS Imperial, Perolera, Smooth Cayenne	5
		high	haute	hoch	alta		7
21.	VG/MS 4-M	Peduncle: length	Pédoncule : longueur	Blütenstandstiel: Länge	Pedúnculo: longitud		
QN	(d)	short	court	kurz	corto	BRS Victoria, Smooth Cayenne	1
		medium	moyen	mittel	medio	BRS Imperial, Singapore Canning	2
		long	long	lang	largo	Perola	3
22.	VG/MS 4-M	Peduncle: diameter	Pédoncule : diamètre	Blütenstandstiel: Durchmesser	Pedúnculo: diámetro		
QN	(d)	small	petit	klein	pequeño	Singapore Canning	1
		medium	moyen	mittel	medio	Perola	2
		large	grand	groß	grande	Smooth Cayenne	3
23.	VG 4-M	Plant: number of underground suckers	Plante : présence de rejets souterrains	Pflanze: Anzahl unterirdischer Schößlinge	Planta: número de bulbillos de raíz		
QN	(d)	none or very few	aucune ou très faible	keine oder sehr wenige	ninguno o muy pocos	Perola	1
		few	faible	wenige	pocos	Perolera	2
		medium	moyenne	mittel	medio	Aus-Jubilee, MD-2, Red Spanish, Smooth Cayenne	3
		many	forte	viele	muchos	Queen, Singapore Canning	4
24.	VG 4-M	Plant: number of aerial suckers on stem	Plante : nombre de rejets aériens sur la tige	Pflanze: Anzahl oberirdischer Schößlinge am Stamm	Planta: número de brotes laterales en el tallo		
QN	(d)	none or very few	nul ou très faible	keine oder sehr wenige	ninguno o muy pocos	Perola, Smooth Cayenne	1
		few	faible	wenige	pocos		2
		medium	moyen	mittel	medio	Aus-Carnival, Smooth Cayenne	3
		many	élevé	viele	muchos	Queen	4
25.	VG 4-M	Plant: size of aerial suckers on stem	Plante : taille des rejets aériens sur la tige	Pflanze: Größe der oberirdischen Schößlinge am Stamm	Planta: tamaño de los brotes laterales en el tallo		
QN	(d)	small	petits	gering	pequeño		1
		medium	moyens	mittel	medio	Smooth Cayenne	2
		large	grands	groß	grande	Aus-Carnival, Fils de Chalvet	3

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
26. VG/MS (*) 4-M	Plant: number of slips	Plante : nombre de bulbilles	Pflanze: Anzahl Schößlinge am Fruchtstiel	Planta: número de bulbillos		
QN	(d) none or very few few medium many	nul ou très faible faible moyen élevé	keine oder sehr wenige wenige mittel viele	ninguno o muy bajo bajo medio alto	Smooth Cayenne Aus-Carnival, MD-2 Queen, Red Spanish BRS Imperial, Perola, Perolera	1 3 5 7
27. VG/MS (+) 4-M	Plant: size of slips	Plante : taille des bulbilles	Pflanze: Größe der Schößlinge am Fruchtstiel	Planta: tamaño de los bulbillos		
QN	(d) small medium large	petites moyennes grandes	klein mittel groß	pequeño medio grande	Queen Smooth Cayenne	3 5 7
28. VG 4-M	Crown: number	Couronne : nombre	Krone: Anzahl	Corona: número		
QL	(d) one more than one	un plus d'un	eine mehr als eine	uno más de uno	Smooth Cayenne Queen, Red Spanish	1 2
29. VG (+) 4-M	Crown: attitude	Couronne : port	Krone: Haltung	Corona: porte		
QN	(d) upright semi upright spreading	dressée demi dressée étalée	aufrecht halbaufrecht breitwüchsig	erecto semierecto rastrero	Perola BRS-Imperial, MD-2, Smooth Cayenne BRS Vitoria, Perolera	1 2 3
30. VG 4-M	Crown: size	Couronne : taille	Krone: Größe	Corona: tamaño		
QN	(d) small medium large	petite moyenne grande	klein mittel groß	pequeña media grande	Rondon Perola, Queen Smooth Cayenne	3 5 7
31. VG (*) (+) 4-M	Fruit: shape	Fruit : forme	Frucht: Form	Fruto: forma		
PQ	(d) narrow ovate medium ovate oblong elliptic circular	ovale étroit ovale moyen oblong elliptique circulaire	schmal eiförmig mittel eiförmig rechteckig elliptisch kreisförmig	ovado estrecho ovado medio oblongo elíptico circular	Gomo de Mel, Perola BRS Imperial, BRS Vitoria MD-2, Perolera Smooth Cayenne Red Spanish	1 2 3 4 5

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota	
32.	VG/ MS	Fruit: length	Fruit : longueur	Frucht: Länge	Fruto: longitud		
	4-M						
QN	(d)	short	court	kurz	corto	Singapore Canning	3
		medium	moyen	mittel	medio	BRS Imperial, Perolera, Smooth Cayenne	5
		long	long	lang	largo	Perola	7
33.	VG/ MS	Fruit: diameter	Fruit : diamètre	Frucht: Durchmesser	Fruto: diámetro		
	4-M						
QN	(d)	small	petit	klein	pequeño	Perola	3
		medium	moyen	mittel	medio	BRS Imperial, Singapore Canning	5
		large	grand	groß	grande	Perolera, Smooth Cayenne	7
34.	VG	Fruit: predominant color	Fruit : couleur prédominante	Frucht: dominierende Farbe	Fruto: color predominante		
	4-M						
PQ	(d)	cream	crème	cremefarben	crema		1
		yellow green	vert jaune	gelbgrün	verde amarillento		2
		green	vert	grün	verde	Perola	3
		grey green	vert gris	graugrün	verde grisáceo		4
		light yellow	jaune clair	hellgelb	amarillo claro	BRS Vitoria	5
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Smooth Cayenne	6
		orange	orange	orange	naranja	MD-2	7
		orange red	rouge orangé	orangerot	rojo anaranjado	Manzana, Roxo de Tefe	8
		red	rouge	rot	rojo		9
		brown	brun	braun	marrón		10
35.	MS/ VG	Fruit: size	Fruit : taille	Frucht: Größe	Fruto: tamaño		
	4-M						
QN	(d)	very small	très petit	sehr klein	muy pequeño	Victoria	1
		small	petit	klein	pequeño	Aus-Jubilee, Singapore Canning	3
		medium	moyen	mittel	medio	Aus-Carnival, Red Spanish	5
		large	grand	groß	grande	Smooth Cayenne	7
		very large	très grand	sehr groß	muy grande	Cabeza de Onca, Pouco conhecida, Sugiro Cabezona	9

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota	
36.	VG	Fruit: size of eye	Fruit: taille de l'œil	Frucht: Größe des Auges	Fruto: tamaño del ojo		
(*)	4-M						
QN	(d)	small	petit	klein	pequeño	Black Antigua	3
		medium	moyen	mittel	medio	Perola, Smooth Cayenne	5
		large	grand	groß	grande	Red Spanish	7
37.	VG	Fruit: fruitlet apex	Fruit : sommet du jeune fruit	Frucht: Spitze der Einzelfrucht	Fruto: ápice del fruto sencillo		
(*)	4-M						
(+)							
QN	(d)	sunken	légèrement en creux	eingesenken	hundido	Singapore Canning	1
		flat	plat	flach	plano	Perola, Smooth Cayenne	2
		prominent	proéminent	hervortretend	prominente	BRS Imperial, Queen	3
38.	VG	Fruit: evenness of color of eyes	Fruit : régularité de la couleur des yeux	Frucht: Gleichmäßigkeit der Farbe der Augen	Fruto: uniformidad del color de los ojos		
(+)	4-M						
QN	(d)	even or slightly uneven	régulière ou très légèrement irrégulière	gleichmäßig oder leicht ungleichmäßig	uniforme o ligeramente irregular	Queen	1
		moderately uneven	modérément irrégulière	mäßig ungleichmäßig	moderadamente irregular	MD-2	2
		strongly uneven	fortement irrégulière	stark ungleichmäßig	muy irregular	BRS Imperial, Perola, Smooth Cayenne	3
39.	VG	Fruit: color of flesh	Fruit : couleur de la chair	Frucht: Farbe des Fleisches	Fruto: color de la pulpa		
(*)	4-M						
PQ	(d)	whitish yellow	jaune blanchâtre	weißlich gelb	amarillo blanquecino	Perola	1
		light yellow	jaune clair	hellgelb	amarillo claro	Smooth Cayenne	2
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Perolera	3
		yellowish orange	orange jaunâtre	gelblich orange	naranja amarillento	Queen	4
40.	VG/MS	Fruit: diameter of core	Fruit : diamètre du cœur	Frucht: Durchmesser des Marks	Fruto: diámetro del corazón		
	4-M						
QN	(d)	small	petit	klein	pequeño	BRS Victoria, Singapore Canning	3
		medium	moyen	mittel	medio	Queen	5
		large	grand	groß	grande	Smooth Cayenne	7
41.	VG	Flesh: evenness of color	Chair : homogénéité de la chair	Fleisch: Gleichmäßigkeit der Farbe	Pulpa: uniformidad del color		
	4-M						
QN	(d)	even or slightly uneven	homogène ou très légèrement hétérogène	gleichmäßig oder leicht ungleichmäßig	uniforme o ligeramente irregular	MD-2, Queen	1
		moderately uneven	modérément hétérogène	mäßig ungleichmäßig	moderadamente irregular	Smooth Cayenne	2
		strongly uneven	fortement hétérogène	stark ungleichmäßig	muy irregular	73-50	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
42.	VG	Flesh: density	Chair : densité	Fleisch: Dichte	Pulpa: densidad		
(*)	4-M						
QN	(d)	loose	lâche	locker	suelta	Queen	1
		medium	moyenne	mittel	media	Smooth Cayenne	2
		dense	dense	dicht	densa	Perolera	3
43.	MS	Flesh: firmness	Chair : fermeté	Fleisch: Festigkeit	Pulpa: firmeza		
(+)	4-M						
QN	(d)	soft	tendre	weich	blanda	Perola, Rondon	3
		medium	moyenne	mittel	media	Smooth Cayenne	5
		firm	ferme	fest	firme	BRS Imperial, Perolera	7
44.	VG	Flesh: fibrousness	Chair : fibrosité	Fleisch: Fasrigkeit	Pulpa: fibrosidad		
(+)	4-M						
QN	(d)	low	faible	gering	baja	Perola	1
		medium	moyenne	mittel	media	Smooth Cayenne	2
		high	forte	hoch	alta	BRS Imperial, MD-2, Singapore Canning	3
45.	VG	Flesh: aroma	Chair : arôme	Fleisch: Aroma	Pulpa: aroma		
	4-M						
QN	(d)	weak	faible	schwach	débil		1
		medium	moyen	mittel	medio	Perola, Smooth Cayenne	2
		strong	fort	stark	fuerte	MD-2, Queen	3
46.	VG	Flesh: juiciness	Chair : succulence	Fleisch: Saftgehalt	Pulpa: succulencia		
(*)	4-M						
QN	(d)	low	basse	gering	baja	BRS Imperial, Pomare	1
		medium	moyenne	mittel	media	Queen, Smooth Cayenne	2
		high	élevée	hoch	alta	Perola	3
47.	MS	Flesh: acidity	Chair : acidité	Fleisch: Säure	Pulpa: acidez		
(+)	4-M						
QN	(d)	low	faible	gering	baja	Perola, Queen	3
		medium	moyenne	mittel	media	Rondon	5
		high	élevée	hoch	alta	Red Spanish, Smooth Cayenne	7
48.	MS	Flesh: sweetness	Chair : goût sucré	Fleisch: Süße	Pulpa: dulzura		
(*)	4-M						
(+)							
QN	(d)	low	faible	gering	baja	Singapore Canning	3
		medium	moyen	mittel	media	Perolera, Smooth Cayenne	5
		high	élevé	hoch	alta	BRS Imperial, Queen	7

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:

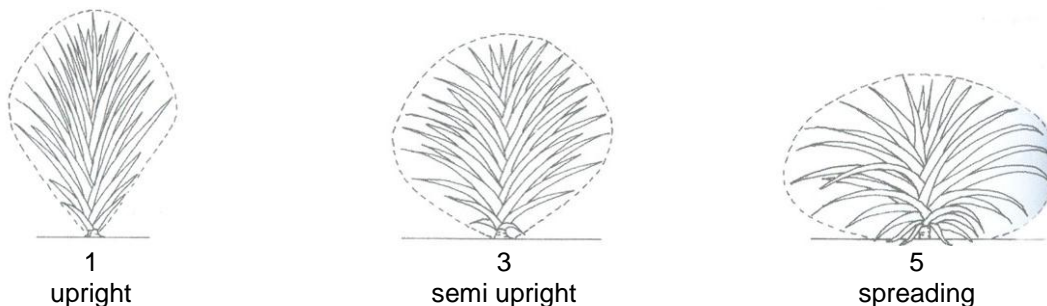
- (a) (Characteristics 1 to 13) Should be observed at the time floral induction is provoked artificially (stage 1-T), which is generally about 36 to 54 weeks after planting, depending on the location and the varieties.
- (b) (Characteristics 14 to 18) Observations related to flowering, inflorescence and flowers should be made on 10 inflorescences, at the time of anthesis (stage 2-A). Measurements of floral parts to be taken on 10 flowers removed at mid-anthesis.
- (c) (Characteristic 19) Observations of fruits before maturity should be made on 10 fruits, 4-6 months after floral induction is provoked (immature fruit—stage 3-I), at maximum size before the fruits starts to mature.
- (d) (Characteristics 20 to 48) Observations related to plant and fruit at harvest should be made in the plot on 10 plants and 10 fruits. It is considered that harvest time is the stage at which the fruit is ready for consumption (actual maturity—stage 4-M).

Growth stages

- 1-T: At fully vegetative growth stage, before flower emergence
- 2-A: Anthesis stage
- 3-I: Immature fruit stage, before physiologically ripe
- 4-M: Maturity stage, when physiologically ripe

8.2 *Explanations covering individual characteristics*

Ad. 1: Plant: growth habit



Ad. 2: Plant: number of leaves

Leaves produced between planting and floral emergence.

Ad. 3: Leaf: length

Ad. 4: Leaf width

The leaf to be observed is the longest at the time floral induction is provoked. Measurements should be made on 10 leaves.

Ad. 7: Leaf: trichomes on lower side

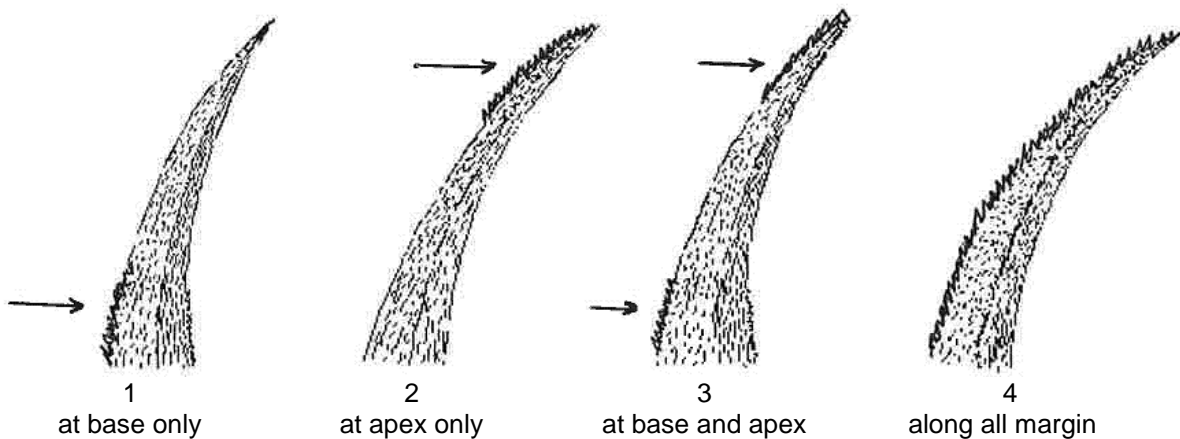
Trichomes are to be observed including hairs. They are located on the lower side of the leaf.

Ad. 8: Leaf: piping

“Piping” as named by Collins and Kerns (1946). The meaning is that the lower epidermis is folded over the leaf edge and extended over the upper surface, to produce a narrow silvery stripe.



Ad. 11: Leaf: position of spines at margin



Ad. 14: Inflorescence: size of bracts

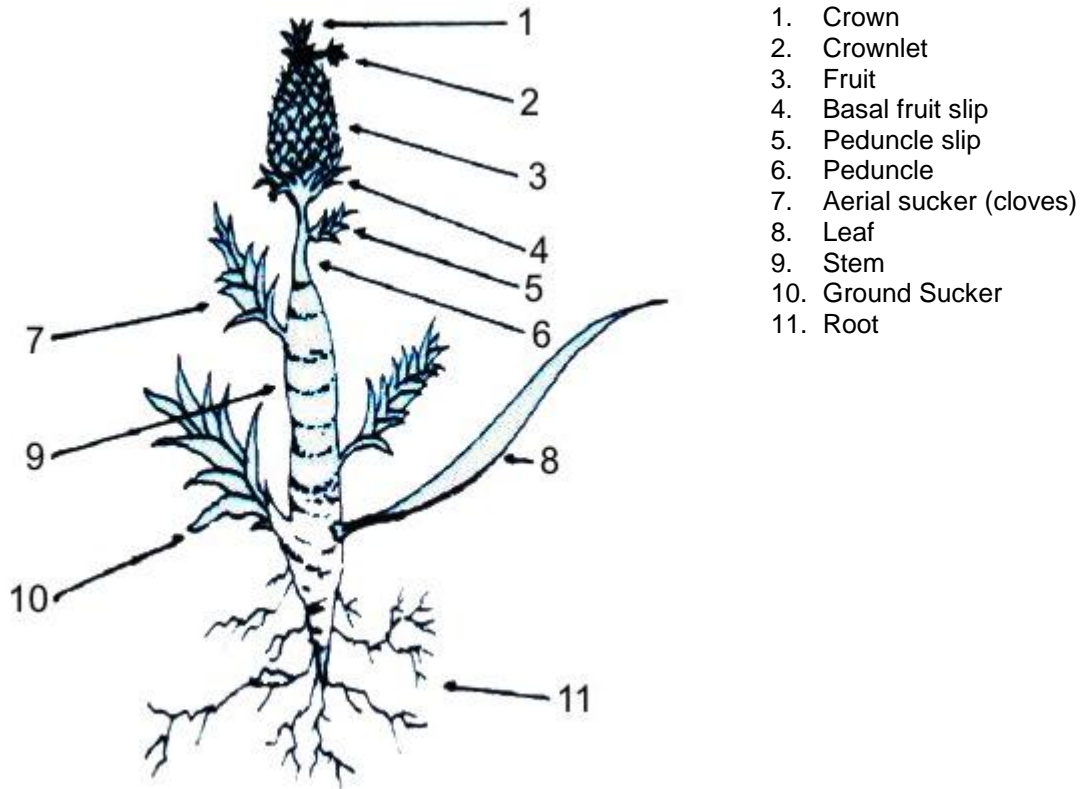
Bracts are borne on the fruit at the base of each fruitlet.

Ad. 21: Peduncle: length

Ad. 24: Plant: number of aerial suckers on stem

Ad. 27: Plant: size of slips

Ad. 29: Crown: attitude



Ad. 22: Peduncle: diameter






To be observed, before fruit development, at middle.

Ad. 25: Plant: size of aerial suckers on stem

To be observed at fruit harvest.

Ad 31: Fruit: shape

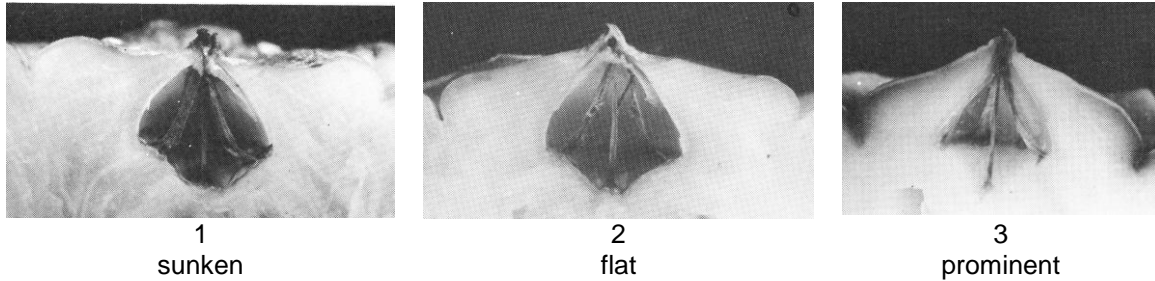
To be observed excluding neck.

		< broadest part >		
		(below middle)	at middle	(above middle)
< shape of apical half >	flat parallel sides		 3 oblong	
	rounded	 2 medium ovate	 4 elliptic  5 circular	
	pointed	 1 narrow ovate		

Ad 32: Fruit: length

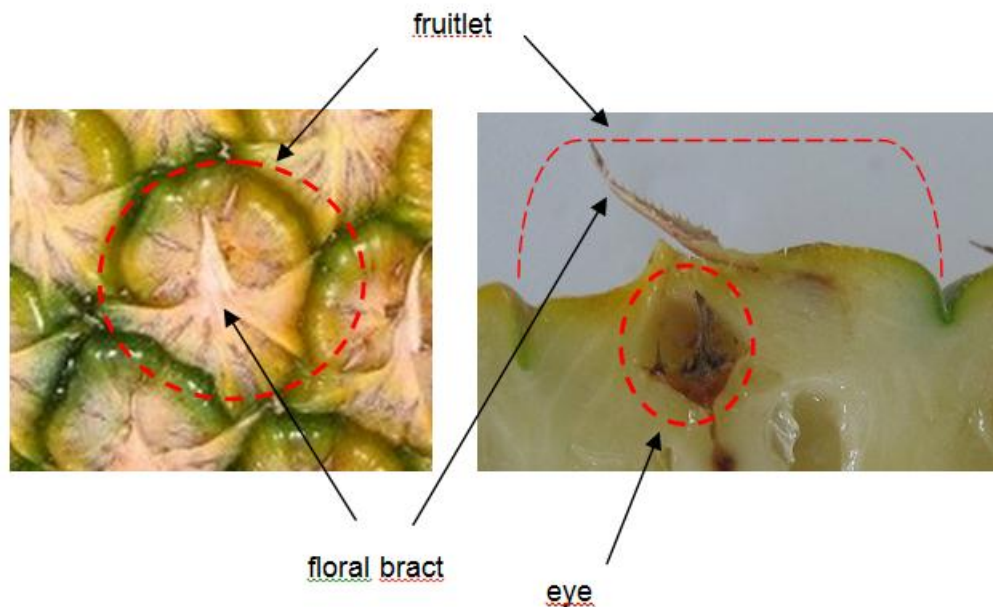
To be observed excluding crown.

Ad. 37: Fruit: fruitlet apex



Ad. 38: Fruit: evenness of color of eyes

To assess the regularity of the eye color from the basal to the upper part of the fruit.



Ad. 43: Flesh: firmness

To be assessed with a penetrometer (after removal of skin and eyes).

Ad. 44: Flesh: fibrousness

While eating, evaluate the amount of fiber and flesh (after removal of the skin and eyes).

Ad. 47: Flesh: acidity

Acidity is considered as free acids content and determined by titration.

Ad. 48: Flesh: sweetness

Sweetness is considered as total soluble solids content and determined with a refractometer.

8.3 *Synonyms of Example varieties (Bartholomew et al., 2002)*

<u>Example variety</u>	<u>Synonyms</u>
Queen	Mc Gregor
Smooth Cayenne	Champaka, Cayenne, F 200, Mc Gregor, Ripley Queen, Alexande, Kew, Giant Kew, Sarawak
MD-2	Golden Ripe, Extra Sweet, Gold
Manzana	Burmenguesa
Singapore Canning	Singapore Spanish, Ruby, Red Pine, Nanas merah, Nangka, Gandul, Betek, Masmerah
Red Spanish	Española Roja / Black Spanish, Key Largo, Havannah, Habanna / Cubana / Cowboy, Bull Head, Cumanesa, Native Philippine Red

9. Literature

Bartholomew, D. P., Paul, R. E., and Rohrbach, K. G., eds., 2002: The Pineapple: Botany, Production and Uses. University of Hawaii, Manoa, Honolulu, US, 320 pp.

Collins, J.J., Kerns, K.R., 1946: Inheritance of three leaf types in the pineapple. Journal of Heredity, Vol. 37, Issue 4. American Research Association. US, pp. 123 to 128

Cunha, G.A.P. da, Cabral, J.R.S, 1999: Taxonomia, espécies, cultivares e morfologia. In: Cunha, G.A.P. da; Cabral, J.R.S.; Sous A, L.F. da S. (Org). O Abacaxizeiro, Cultivo, Agroindústria e Economia. Brasília: Embrapa Comunicação para Transferência de Tecnologia, pp. 17 to 51

Py, C., Lacoëuilhe, J.J., Teisson, C., 1984: L'ananas, sa culture, ses produits. Collection techniques agricoles et productions tropicales. Éditions Maisonneuve et Larose, Paris, FR, 562 pp.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Ananas comosus (L.) Merr."/>	
1.2 Common name	<input type="text" value="Pineapple"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross []
(please state parent 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:
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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 Seed

4.2.3 Other
(please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.1 Plant: growth habit (1)		
upright	Perola	1[]
upright to semi upright		2[]
semi upright	Smooth Cayenne	3[]
semi upright to spreading		4[]
spreading	Perolera	5[]
5.2 Leaf: anthocyanin coloration (6)		
absent or very weak	Aus-Jubilee, BRS Vitoria, MD-2, Selangor Green	1[]
very weak to weak		2[]
weak	Pot à eau	3[]
weak to medium		4[]
medium	Smooth Cayenne	5[]
medium to strong		6[]
strong	Rondon	7[]
strong to very strong		8[]
very strong	Roxo de Tefe, 73-50	9[]
5.3 Leaf: piping (8)		
absent	Queen, Samba	1[]
present	Perolera, Singapore Canning	9[]
5.4 Leaf: spines (9)		
absent	BRS Imperial, Perolera, Samba, Singapore Canning	1[]
present	Queen	9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.5 Fruit: shape (31)		
narrow ovate	Gomo de Mel, Perola	1[]
medium ovate	BRS Imperial, BRS Vitoria	2[]
oblong	MD-2, Perolera	3[]
elliptic	Smooth Cayenne	4[]
circular	Red Spanish	5[]
5.6 Fruit: predominant color (34)		
cream		1[]
yellow green		2[]
green	Perola	3[]
grey green		4[]
light yellow	BRS Vitoria	5[]
medium yellow	Smooth Cayenne	6[]
orange	MD-2	7[]
orange red	Manzana, Roxo de Tefe	8[]
red		9[]
brown		10[]
5.7 Fruit: color of flesh (39)		
whitish yellow	Perola	1[]
light yellow	Smooth Cayenne	2[]
medium yellow	Perolera	3[]
yellowish orange	Queen	4[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for the characteristic(s) for your candidate variety
<i>Example</i>	<i>Leaf: anthocyanin coloration</i>	<i>absent or very weak</i>	<i>medium</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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9. Information on plant material to be examined or submitted for examination.

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

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

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

Please provide details for where you have indicated "yes".

.....

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

Yes []
(please provide details as specified by the Authority)

No []

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

Applicant's name

Signature

Date

[End of document]