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GENEVA

DRAFT

PINEAPPLE

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Ananas comosus (L.) Merr.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from France**to be considered by the Technical Working Party for Fruit Crops
at its thirty-seventh session, to be held in Salvador, Bahia State, Brazil,
from August 21 to 25, 2006*

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. of the family Bromeliaceae.

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.

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

20 aerial suckers

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

2.8 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*

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 code in the first column of the Table of Characteristics:

- 1-T: at vegetative maturity growth stage, immediately before flower induction (or before flower emergence ?)
- 2-A: Anthesis stage
- 3-I: Immature fruit stage
- 4-M: Maturity stage.

3.4 *Test Design*

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

3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 20 plants or parts taken from each of 20 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

3.6 *Additional Tests*

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.2 *Uniformity*

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

4.3 *Stability*

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

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics: (to review)

- (a) Leaf: leaf edges aspect (piping/not piping) (characteristic 14)
- (b) Leaf: aspect of not-piping leaf edges (characteristic 15)
- (c) Fruit: shape when ripe (characteristic 53)
- (d) Fruit: predominant color when ripe (characteristic 54)
- (e) Fruit: eye profile (characteristic 68)
- (f) Fruit/flesh: color (characteristic 71)

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

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 *States of Expression and Corresponding Notes*

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

6.3 *Types of Expression*

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

6.4 *Example Varieties*

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

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6 (Section 6.1.2)

QL Qualitative characteristic – see Chapter 6.3

QN Quantitative characteristic – see Chapter 6.3

PQ Pseudo-qualitative characteristic – see Chapter 6.3

(a)-(f) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.

1-T See Chapter 3.3.2

2-A See Chapter 3.3.2

3-I See Chapter 3.3.2

4-M See Chapter 3.3.2

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

NOTE: 1st column: **xF** refers to the French (FR) doc.
Brx refers to the Brazilian (BR) doc.

7th column Example varieties or RHS color code:
Bold = Agreed by France (FR) and Brazil (BR)
Regular = Proposed by France (FR)
Italic = Proposed by Brazil (BR)

whole table: *Italic = Brazil (BR) proposal*

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	1-T	plant: foliage habit (before flowering)	Plant: port du feuillage			
	(a)	upright	érigé		Perola	1
QN		semi upright	semi-érigé		Smooth Cayenne	3
VG		spreading	étalé		Perolera	5
2.	1-T	plant: number of leaves (produced from 4 months after planting to forcing)	Plant: nombre de feuilles émises entre 4 mois après plantation et l'induction florale)			
Br2	(a)	few	peu		<i>Perola</i>	3
(+)		medium	moyen		<i>Smooth Cayenne</i>	5
		many	Beaucoup			7
3.	1-T	reference leaf: length (the longer leaf?)	Feuille de référence: longueur			
Br3	(a)	<i>short</i>	Petit		Queen	3
(+)	(b)	medium	Moyen		Smooth Cayenne	5
		<i>long</i>	Grand		Perola	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4.	1-T Reference leaf: width	Feuille de référence: largeur				
Br4	(a) narrow	Etroite			Queen	3
(+)	(b) medium	moyen			Smooth Cayenne	5
	large or broad	large			Perola	7
5.	1-T Leaf: main color	Feuille: couleur principale				
(*)	green	vert			Smooth Cayenne, Jupi, <i>Perola</i>	3
	reddish	rougeâtre			Roxo de tefe	4
	purplish	violacé				5
	green purple	vert foncé				
6	1-T Leaf: intensity of green color	Feuille: intensité de la couleur verte				
	light					3
	medium					5
	dark					7
7.	1-T Leaf: variegation	Feuille: panachures (sur la face supérieure)				
Br7	(a) absent	absente			<i>Perola, Smooth Cayenne</i>	1
	present	Présente			<i>Abacaxi Tricolor</i>	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8.	1-T Leaf: distribution of variegations (on upper side)	Feuille: répartition des panachures (sur la face supérieure) (to be precised by France : the none pigmentation affects, longitudinally, along the central grooves or along the margins)				
	(a) along margins	marges achlorophylliennes				1
	along the central grooves	gouttière achlorophyllienne				2
9.	1-T Leaf: presence of anthocyanins (on upper side)	Feuille: anthocyane (sur la face supérieure)				
(*) QL	(a) absent	absente			Spanish vert	1
	present	présente			<i>Perola, Smooth Cayenne</i>	9
10.	1-T Leaf: intensity of anthocyanin coloration (on upper side)	Feuille: expression des anthocyanes (sur la face supérieure)				
(*)	absent or very weak	absent ou très faible				1
	(a) weak	faible			Pot à eau	3
	medium	moyen			Champaka	5
	strong	fort			Rondon	7
	very strong	très fort			Roxo de Tefe	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.	1-T Leaf: transversal distribution of anthocyanins	Feuille: répartition transversale des anthocyanes	Brazil proposes to delete ?			
	(a) predominantly on margins	principalement sur les marges			Singapore canning	1
	even on margins and in groove	uniformément sur les marges et dans la gouttière				2
	predominantly in the groove	principalement dans la gouttière			Rondon	3
12.	1-T Longitudinal Leaf: distribution of anthocyanin coloration	Feuille: répartition longitudinale des anthocyanes	Brazil proposes to delete ?			
	(a) predominantly towards the base	principalement vers la base			Manzana	1
	along the whole leaf	sur toute la longueur de la feuille				2
	predominantly towards the apex	principalement vers l'apex			Cayenne	3
13.	1-T Leaf: presence of trichomes on lower surface // Spines (Br car 8??)	Feuille: présence de trichomes sur la face inférieure				
	(a) few // or absent or very weak (Br car 8)	faible				3
	medium	moyen			Perolera	5
	a lot	fort			Cayenne	7
Br8 (+)	Leaf: spines	Feuille: épines				
	absent					1
	inconspicuous					2
	conspicuous					3
	CIRAD to provide a drawing or an explanation to precise spines, trichomes and piping ?					

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14	1-T Leaf: piping edge	Feuille: caractère				
(*)		“ourlé”/ “piping”				
	(a) absent	ourlé/piping			Manzana	1
	present	non ourlé/non-piping			Singapore canning, Smooth Cayenne, Queen	2
	<p>The characters 13 and 14 are to be harmonized with IPGRI descriptors; Cirad or Brazil should explicit :</p> <p>- trichomes</p> <p>- piping</p> <p>Do you have photographs?</p>					
15.	1-T Leaf: aspect of not-piping leaf edges	Feuille: bordure du limbe des types non-piping	Brazil proposes to delete ?			
(*)						
	(a) spines along all margins	épineuse			Mac Gregor	1
	spines occur irregularly along both margins	demi épineuse			Fina de hiero	2
	spines behind tip only	épines d’extrémités			Champaka	3
	sand paper	lisse papier de verre			Samba	4
	smooth	lisse			Singapore canning	5
Br9	Leaf: Distribution of spines at margin					
(+)						
	at base only					1
	at apex only				Smooth Cayenne	2
	at base and apex					3
	regular				Perola	4
	irregular					5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16.	1-T Leaf: distance between spines	Feuille: distance entre les épines	Brazil proposes to delete ?			
	(a) small	courte			Perola	3
	medium	moyenne				5
	large	longue			Queen	7
17.	Spine: color in relation to leaf blade	Epines: couleur par rapport au limbe				
	(a) same as leaf blade	la même que le limbe				1
	different from leaf blade	différente de celle du limbe				2
18.	1-T Spine: size	Epines : taille	Brazil proposes to delete ?			
	(a) small	petite			Perola	3
	medium	moyenne			Singapore canning	5
	large	grande			Queen	7
19.	2-A Peduncle: bract color of ventral side	Pédoncule floral: couleur de la face ventrale/interne des feuilles bractéales				
(*)						
(+)						
	(c) green	vert				1
	light pink	rose pale				2
	medium pink	rose vif			RHS 50 A	3
	dark pink	rose foncé			RHS 46 C	4
	medium red	rouge			RHS 44 B	5
	dark red	rouge sombre			RHS 45 A, 45 B.	6
	Cirad to provide a drawing for these bract peduncle					

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	2-A	Inflorescence: floral bract size (before fruit development)	Inflorescence: taille de la bractée florale			
	(c)	small	petite		Perola	3
		medium	moyen		Queen	5
		large	grande		Singapore canning	7
21.	2-A	Inflorescence: flowering pattern	Inflorescence/ fleurs: type de floraison			
	(c)	flowering proceeds from bottom to top or acropétale	acropétale		Champaka	1
		irregularly			Perola	2
22.	2-A	Inflorescence: proportion of open flowers	Inflorescence/ fleurs: proportion de fleurs ouvertes (Is it the same character as the character 14 ?)	France CIRAD proposes to delete		
	(c)	null	Aucune			1
		weak	certaines		Singapore canning	2
		high (all)	toutes		Champaka	3
Or? Br10 (+)		Inflorescence: number of fertile flowers		France CIRAD proposes to delete		
		low			Perola	3
		medium			Smooth Cayenne	5
		high				

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. Br14	2-A Inflorescence: coloration of apex	Inflorescence/ pétale: couleur de l'apex	Please, check the states of expression and example varieties			
	(c) <i>whitish (Br)</i>					
	<i>light purple (Br)</i>					
	<i>medium purple (Br)</i>				<i>Smooth Cayenne</i>	
	red-purple or dark purple (Br)	violet rouge			Perola (98 A)	
	blue-purple	violet bleu			Smooth Cayenne (89A)	
24. Br15 (+)	2-A Petal: size of white area (without removing the flower from the fruit)	Inflorescence/ pétale: proportion de blanc visible (pétale en place)				
	(c) absent or very small	nulle ou très faible			Singapore canning	1
	small	faible			Smooth Cayenne	3
	medium	moyenne			Perolera	5
	large	forte			Jupi, Perola	7
25. Br12	2-A Inflorescence: petal length	Inflorescence/ pétale: longueur	Brazil proposes to delete ?			
	(c) short	courte			Singapore canning	3
	medium	moyenne			Smooth Cayenne	5
	long	longue			Rondon	7
Br12	Flower: petals base	Is this character reliable ?	CIRAD comment: not easy to assess			
	free	Séparé ?				1
	fused					2
Br13	Flower: imbricate petals	Is this character reliable ?	CIRAD comment: not easy to assess			
	absent		Brazil proposes to delete ?			1
	present					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26.	2-A Inflorescence: sepal length	Inflorescence/ sépale: longueur				
	(c) short	courte	Brazil proposes to delete ?		Perola	3
	medium	moyenne			Smooth Cayenne	5
	long	grande			Queen	7
Br11	Sepal: predominant color					
	whitish					1
	greenish					2
	purplish				Smooth Cayenne	3
27.	2-A Flower: style type	Fleur : type de fleur				
Br18 (+)	(c) brévistyle	brévistyle	Brazil proposes to delete ?			1
	équistyle	équistyle				2
	longistyle	longistyle			<i>Perola, Smooth Cayenne</i>	3
Br16	Flower: distribution of anthers	(in accordance with IGPRI discriptor ??)				
	separate					1
	grouped					2
28.	2-A Inflorescence/ stamens: pollen quantity	Inflorescence/ étamines: quantité de pollen (how can we estimate it ? Mexique and Israël are making a suppression suggestion)	Brazil proposes to delete ?	France CIRAD comment: it is reliable		
Br17	(c) low	faible			Smooth Cayenne, Perola	3
	medium	moyenne			Queen	5
	high	forte			Perolera	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. 2-A	Inflorescence: stamen length	Inflorescence/ étamines: longueur	Brazil proposes to delete ?			
(c)	short	courte			Smooth Cayenne	3
	medium	moyenne			Rondon	5
	long	longue			Perolera	7
30. 2-A	Inflorescence: style length	Inflorescence/ pistil: longueur	Style is concerned			
(c)	short	courte	Brazil proposes to delete ?		Singapore canning	3
	medium	moyenne			Red Spanish	5
	long	longue			Perolera	7
		<u>Characters 28,29,30, Isn't it too precised and difficult for making an evaluation?</u>				

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31.	3-I Fruit: color (fully developed immature fruit)	Fruit immature: couleur externe principale				
	(d) <i>grey green (Br)</i>		Is grey green identical to white green and grey?			x
Br31	white green =?Grey green	blanc vert			RHS 157 C	1
	<i>light green (Br)</i>				<i>Perola</i>	
	medium green	vert			RHS 143 A	2
	dark green	vert foncé			RHS 139 A, <i>Smooth Cayenne</i>	3
	brownish-green	vert brun	Brazil proposes to delete ?			4
	pink	rose	Brazil proposes to delete ?		RHS 52 A	5
	medium red	rouge	Brazil proposes to delete ?		RHS 45 A	6
	brown purple	rouge foncé			RHS 187 A	7
	brownish purple	brun rouge			RHS 178 A	8
	<i>purple (Br)</i>					
	dark brown	marron foncé			RHS 200 A	9
32.	3-I Fruit: presence of trichomes when unripe	Fruit immature: présence de trichomes	Brazil proposes to delete ?			
	(d) low	faible			<i>Perola</i>	3
	medium	moyenne				5
	high	forte			<i>Cayenne</i>	7
33.	4-M Plant: fruit habit when ripe	Plant: port du fruit	Brazil proposes to delete ?			
	(e) flattened	verse			<i>Perolera</i>	3
	bending	incliné			<i>Smooth Cayenne</i>	5
	upright	érigé			<i>Perola</i>	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34.	4-M Plant: part of the plant bending or flattening	Plant: partie du plant responsable de la verse	Brazil proposes to delete ?			
(e)	fruit	fruit				1
	peduncle	pédoncule			Smooth Cayenne	2
	whole plant	plant entier			Perolera	3
35.	4-M Plant: height from the ground to the top of the foliage	Plant: hauteur sol-limite supérieure du feuillage				
(e)	short	courte			Rondon	3
	medium	moyenne			Queen	5
	high	haute			Perola	7
36.	4-M Plant: height from the ground to fruit base	Plant: hauteur sol-base du fruit				
(e)	short	courte			Queen	3
	medium	moyenne			Perolera	5
	high	haute			Rondon	7
37. (*)	4-M Peduncle: length	Pédoncule: longueur				
Br20 (+)	(e) short	courte			Smooth Cayenne	3
	medium	moyenne			Singapore canning	5
	long	longue			Perola	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38.	4-M	Peduncle diameter (at middle)	Pédoncule: diamètre			
Br21 (+)	(e)	small	petite		Singapore canning	3
		medium	moyenne		Smooth Cayenne, Perola	5
		large	grande			7
Br23		Peduncle: number of bracts		Brazil proposes to delete		
		low				3
		medium				5
		high				7
Br24		Imbricate bracts		Brazil proposes to delete		
		absent				1
		present				9
Br25		Peduncle: trichomes				
		absent				1
		present				9
<i>Relation between car 19 and 37/38 characteristics to be studied: do we study the same organ for these characteristics ?</i>						
39. (*)	4-M	Suckers: mean number of underground suckers per plant	Rejets: nombre moyen de rejets souterrains par plant (moyenne)			
Br19	(e)	none or very few	nul ou très faible		Manzana,	1
		few	faible		Smooth Cayenne, Perola	3
		medium	moyen		Red Spanish	5
		many	fort		Singapore canning	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. 4-M (*)	Suckers on peduncle: mean number of aerial suckers per plant	Rejets sur le pédoncule: nombre de rejets tige (cayeux) par plant				
(e)	none or very few	nul ou très faible			Perolera, <i>S. Cayenne</i>	1
	few	faible			Perola	3
	medium	moyen			Smooth Cayenne,	5
	many	fort			Queen, <i>Perola</i>	7
	very many (Br)					9
41. 4-M (*)	Suckers on peduncle: size of aerial suckers at fruit harvest	Rejets: taille des rejets tige (cayeux) à la récolte				
Br34 ? (+)	(e) small	petite				3
	medium	moyenne			Champaka	5
	large	grande			Fils de Chalvet	7
42. 4-M (*)	Slips: presence/absence	Bulbilles: présence/absence				
Br35 ?	(e) absent	absente			Smooth Cayenne	1
	present	présente			Queen, Perolera, Perola	9
Br35	Fruit: detachable fruitlets		Brazil proposes to delete ?			
	absent					1
	present					9
Br36	Fruit: relief of fruitlet		Brazil proposes to delete ?			
	flat				<i>Smooth Cayenne</i>	1
	prominent				<i>Perola</i>	3
	very prominent					5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
43.	4-M Slips: number of slips	Bulbilles: nombre de bulbilles	Do we need level 1 and 9 ?			
Br34	(e) few	petit				3
	medium	moyen			Queen, Red Spanish	5
	many	grand				7
44.	4-M Slips: weight of the largest slip	Bulbilles: poids de la bulbille la plus développée	Brazil proposes to delete ?			
	(e) small	petit			Queen	3
	medium	moyen				5
	large	grand			Perola	7
45.	4-M Crown: crown foliage attitude	Couronne: port				
Br45	(e) upright	dressé			Perola	3
	semi upright	ouvert			Smooth Cayenne	5
	spreading	étalé				7
	drooping <i>or</i> <i>decumbent</i>	retombant				9
46.	4-M Crown: color of crown leaves	Couronne: couleur des feuilles	Brazil proposes to delete ?			
	(e) same as plant leaves	identique à la feuille				1
	with more anthocyanins than the plant leaves	plus anthocyanée que la feuille				2
47.	4-M Crown: proportion of plants bearing crownlets	Couronne: fréquence du phénotype "couronnes surnuméraires"	Brazil proposes to delete ?			
	(e) none or very few	nulle ou très faible			Smooth Cayenne	1
	few	faible			Perolera	3
	medium	moyenne				5
	many	forte				7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
48.	4-M	Crown: number of crownlets per fruit	Couronne: nombre de couronnes surnuméraires par fruit	Brazil proposes to delete ?		
	(e)	small	petit		Perolera	3
		medium	moyen			5
		high	grand			7
49.	4-M	Crown: proportion of plants with multiple crowns	Couronne: fréquence du phénotype "couronnes multiples"			
Br48	(e)	none or very low	nulle ou très faible			1
		low	faible			3
		medium	moyenne			5
		high	forte			7
		<i>very high (Br)</i>				9
50.	4-M	Crown height	Couronne: hauteur			
	(*)					
Br46	(e)	very short	très courte		Certains Queen	1
	(+)	short	courte		Queen	3
		medium	moyenne		Smooth Cayenne, Perola	5
		high	haute		Singapore canning	7
51.	4-M	Crown weight	Couronne: poids			
Br47	(e)	small	petit		Rondon	3
	(+)	medium	moyen		Mac Gregor, <i>Perola</i>	5
		large	grand		Smooth Cayenne	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.	4-M	Fruit: breaking from peduncle	Fruit: rupture fruit-pédoncule (cueillette)	Brazil proposes to delete ?		
	(e)	very easy	très facile			1
		easy	facile			2
		difficult	difficile			3
53.	4-M	Fruit: shape when ripe	Fruit: forme à maturité	Brazil proposes to delete ?		
Br30	(e)	trapezoid, upside down	trapèze inversé		Singapore canning	1
		cylindrical	cylindrique		Perolera, <i>Smooth .Cayenne</i>	2
		<i>cylindrical to conical (Br)</i>				
		ovoid	ovoïde		Smooth Cayenne	3
		conical	conique		Perola	4
		<i>elliptic (Br)</i>				
		trapezoid	trapèze			5
		globular	globuleux		Red Spanish	6

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
54. (*)	4-M Fruit: “skin (Br)?” predominant color when ripe (or Br: color of skin at the point to consume)	Fruit: couleur externe principale				
Br31 (e)	white cream	blanc crème	Brazil proposes to delete white cream		RHS 155 A	1
	green	vert			RHS 147 A	2
	grey green					
	green and yellow	vert jaune				3
	<i>light yellow (Br)</i>				<i>Perola</i>	
	yellow	jaune			RHS 13 A	4
	golden yellow	jaune d’or			RHS 21 A, <i>Smooth.Cayenne</i>	5
	orange	orange			RHS 32 A	6
	orange red	rouge orangé			RHS 42 A	7
	red	rouge			RHS 53 A	8
	<i>purple (Br)</i>					
	brown	marron	Brazil proposes to delete brown		RHS 200 A	9
55. (*)	4-M Fruit: color uniformity when ripe	Fruit: homogénéité de la coloration externe à maturité				
Br33 (e)	heterogeneous =? <i>absente</i>	irrégulière			Rondon	1
	with a gradient =? <i>absente</i>	en gradient			Smooth Cayenne	2
	uniform =? <i>présente</i>	uniforme			Queen	3
56. (*)	4-M Fruit: presence of deformations	Fruit: déformations	Brazil proposes to delete ?			
(e)	none or very slight	absentes				1
	definite, in a hollow shape	en creux				2
	definite, in a hump shape	en bosses				3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
57.	4-M Fruit: presence of knobs on fruit base	Fruit: présence de knobs à la base du fruit	Brazil proposes to delete ?			
	(e) absent	absente				1
	present	présente				9
58.	4-M Fruit: presence of a neck	Fruit: présence d'un collier sur le fruit	Brazil proposes to delete ?			
	(e) absent or sessile like	absente ou très peu visible			Smooth Cayenne	1
	short	légère			Manzana	3
	medium	moyenne				5
	large	prononcée			Abacaxi verde	7
59.	4-M Fruit: height (*)(without neck)	Fruit: hauteur (hors collier)				
Br26	(e) short	courte			Singapore canning	3
(+)	medium	moyen			Perolera, <i>Smooth.Cayenne</i>	5
	high	haute			Perola	7
60.	4-M Fruit: diameter at the lower part (at mid height of the one before last eye)	Fruit: diamètre zone supérieure (mi-hauteur de l'avant-dernier œil)				
Br29	(e) small	petit			Perola	3
(+)	medium	moyen			Singapore canning	5
	large	grand			Perolera, <i>Smooth.Cayenne</i>	7
61.	4-M Fruit: diameter at the middle (*)	Fruit: diamètre zone médiane				
Br28	(e) small	petit			Perola	3
	medium	moyen			Cayenne	5
	large or wide	grand			Red Spanish	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
62.	4-M	Fruit: diameter at the upper part // at base (Br)	Fruit: diamètre zone inférieure (mi-hauteur du 2ème œil)			
Br27	(e)	small	petit		Rondon	3
		medium	moyen		Perola	5
		large or wide	grand		Smooth Cayenne	7
63.	4-M	Fruit: weight (without crown)	Fruit: poids (sans couronne)	Brazil proposes to delete ?		
	(*)					
	(e)	very low	très faible		Victoria	1
		low	faible		Singapore canning	3
		medium	moyen		Red Spanish	5
		high	fort		Smooth Cayenne	7
		very high	très fort		Cabeza de onca	9
64.	4-M	Fruit: volume (without crown)	Fruit: volume (sans couronne)	Brazil proposes to delete ?		
	(e)	very low	très faible			1
		low	faible			3
		medium	moyen			5
		high	fort			7
		very high	très fort			9
65.	4-M	Fruit: apparent density (floatation)	Fruit: densité apparente (flottaison)	Brazil proposes to delete ?		
	(e)	fruit is floating	fruit flotte		Rondon	3
		intermediate	fruit flotte entre deux		Pomare	5
		fruit is sinking	fruit coule		Manzana	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
66.	4-M Fruit: eyes number	Fruit/ œil: nombre d'yeux				
(e)	small	petit			Red Spanish	3
	medium	moyen			Smooth Cayenne	5
	large	grand			Queen	7
67.	4-M Fruit: eye relative surface	Fruit/ œil: taille de l'œil	Brazil proposes to delete ?			
(*)						
(e)	small	petite			Black antigua	3
	medium	moyen			Cayenne	5
	large	grande			Red Spanish	7
68.	4-M Fruit: eye profile	Fruit/ œil: profil de l'œil				
(*)						
(e)	hollow or concave	concave			Singapore canning	1
	flat	plat			Perola	2
	slightly prominent	peu proéminent			Rondon	3
	prominent	proéminent			Queen	4
69.	4-M Fruit: eye color	Fruit/ œil: coloration de l'œil	Brazil proposes to delete ?			
(e)	uniform	homogène			Queen	1
	with a gradient	en gradient			Perola	2
70.	4-M Fruit: relative size of the floral bract compared to eye	Fruit/ œil: taille de la bractée par rapport à l'œil				
(e)	¼	environ 1/4				1
	½	environ 1/2				3
	¾	environ 3/4				5
	equal to the eye	égale à l'œil				7
	greater than the eye	supérieure à œil				9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
71.	4-M	Fruit/flesh: color	Fruit/ pulpe: couleur de la chair	Fruit/flesh: color		
Br37	(e)	white or <i>white cream</i> (<i>Br</i>)	blanc	white or <i>white cream</i> (<i>Br</i>)	Perola (RHS 155A)	1
		pale yellow	jaune pale	pale yellow	Smooth Cayenne (RHS 11A)	2
		yellow	jaune	yellow	Perolera (RHS13B)	3
		golden yellow <i>orange (Br)</i>	jaune d'or	golden yellow <i>orange (Br)</i>	Queen (RHS 21A)	4
72.	4-M	Fruit/flesh: color uniformity from the bottom to the top	Fruit/ pulpe: répartition de la coloration interne sur la hauteur	Brazil proposes to delete ?		
	(e)	uniform	homogène		Queen	1
		with a gradient	selon un gradient		Smooth Cayenne	2
73.	4-M	Fruit/flesh: core diameter Or Br: diameter of central axis	Fruit/ pulpe: diamètre du cœur			
Br41	(e)	small	petit		Singapore canning	3
(+)		medium	moyen		Queen	5
		large or wide	grand		Champaka	7
74.	4-M	Fruit/flesh: eye depth	Fruit/ pulpe: profondeur des yeux			
	(e)	weak	faible			3
		medium	moyenne		Smooth Cayenne	5
		strong or deep	forte		Queen	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
75. 4-M	Fruit/flesh: visual appraisal of density or pulp density	Fruit/ pulpe: remplissage de la pulpe				
(*)						
(e)	weak	faible			Queen	3
	medium	moyen			Smooth Cayenne	5
	strong	fort			Perolera	7
76. 4-M	Fruit/flesh: firmness	Fruit/ pulpe: fermeté de la chair				
Br38	(e) weak or soft	faible			Rondon, <i>Perola</i>	3
	medium	moyenne			Smooth Cayenne	5
	strong or firm	forte			Perolera, <i>Smooth Cayenne</i>	7
77. 4-M	Fruit/flesh: texture	Fruit/ pulpe: texture de la chair	Brazil proposes to delete ?			
(*)						
(e)	smooth	fondante			Perola	1
	crisp	croquante			Queen	2
	fibrous	fibreuse			Singapore canning	3
78. 4-M	Fruit/flesh: fibrousness	Fruit/ pulpe: teneur en fibres				
Br39	(e) low	faible			Perola	3
	medium	moyenne			Smooth Cayenne	5
	high	forte			Singapore canning	7
79. 4-M	Fruit/flesh: aroma or flavor	Fruit/ pulpe: arôme				
Br44	(e) low	faible				3
	medium	moyen			<i>Perola</i>	5
	high	fort			<i>Smooth Cayenne</i>	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
80. (*)	4-M Fruit/flesh: sugar taste	Fruit/ pulpe: appréciation du caractère sucré				
(e)	low	faible			Singapore canning	5
	medium	moyenne			Smooth Cayenne	
	high	forte				7
81. (*)	4-M Fruit/flesh: acidic taste	Fruit/ pulpe: appréciation du caractère acide	Which methodology to be used ?			
Br43	(e) low	faible			Perola	5
	medium	moyenne			Smooth Cayenne	
	high	forte			<i>Smooth Cayenne</i>	7
82. (*)	4-M Fruit/flesh: juiciness	Fruit/ pulpe: teneur en jus				
Br40	(e) low	faible			Pomare	3
	medium	moyenne			Mac Gregor, <i>Smooth Cayenne</i>	5
	high	forte			Smooth Cayenne, <i>Perola</i>	7
83. (*)	4-M Fruit/juice: ascorbic acid content	Fruit/ Jus: teneur en acide ascorbique	Brazil proposes to delete ?			
(e)	low	faible			Smooth Cayenne	5
(f)	medium	moyenne			Perola	7
	high	forte			Perolera	
84. (*)	4-M Fruit/juice: free acids content	Fruit/ Jus: acidité titrable	Brazil proposes to delete ?			
(e)	low	faible			Perola	3
(f)	medium	moyenne			Rondon	5
	high	forte			Red Spanish	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
85. 4-M	Fruit/juice: sugar content (using refractometer)	Fruit/ Jus: indice réfractométrique (IR mesuré)	Is it soluble solids content ?			
(*)						
(e)	low	faible			Singapore canning	3
(f)	medium	moyen			Perolera	5
	high	fort			Cayenne	7
Br42	Or Br:					
(+)	Concentration of soluble solids (Brix degrees)					
	low					3
	medium				Perola, Smooth Cayenne	5
	high					7
B49	Resistance to <i>Fusarium subglutinans</i>					
	high susceptible					1
	susceptible					2
	medium susceptible					3
	medium resistant					4
	resistant					5
	high resistant					6

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 18) All observations related to the vegetative characters should be made on 20 plants or parts of them at the time floral induction is provoked (about 8 months after planting—stage 1-T).
- (b) (Characteristics 3 to 5) The *reference* **(to precise for France and Bresil. What is a reference leaf ? In Brésil it is "the most physiological young active leaf before bud emergence.)** leaf is the longest at the time floral induction is provoked. Measurements to be taken on 20 leaves.
- (c) (Characteristics 19 to 30): Observations related to flowering, inflorescence and flowers should be made on 20 inflorescences, at the time of anthesis (stage 2-A). Measurements of floral parts to be taken on 10 flowers removed at mid-anthesis.
- (d) (Characteristics 31 and 32): Observations of fruits before maturity should be made on 20 fruits, 4 months after floral induction is provoked (immature fruit—stage 3-I).
- (e) (Characteristics 33 to 85): Qualitative observations related to plant and fruit at harvest should be made in the plot on 20 plants and 20 fruits. It is considered that harvest time is the stage at which the fruit is good to be eaten (actual maturity—stage 4-M). Measures to be made on 10 fruits.
- (f) (Characteristics 83 to 85): Analysis should be made on 10 different juices taken from each of 10 fruits. Methods are appended to this document (appendix 1).

8.2 *Explanations for individual characteristics*

OBSERVAÇÕES E FIGURAS / OBSERVATIONS AND FIGURES
FROM BRAZIL (**Br(+)** Characteristics)

Característica Br1: Planta: posição das folhas / *Characteristic Br1: Plant: attitude*



3
semi-ereta
semi-erect



5
intermediária
intermediary



7
aberta
open

Característica Br2: Planta: quantidade de folhas ativas /
Characteristic Br2: Plant: number of active leaves

Aproximadamente considera-se:

(In approach, we can consider / We can consider near by)

- baixa (*low*) < 40
- média (*medium*) 40 – 60
- alta (*high*) > 60

Característica Br3: Folha: comprimento / *Characteristic Br3: Leaf: length*

Aproximadamente considera-se:

(In approach, we can consider / We can consider near by)

- curto (*short*) < 90 cm
- médio (*medium*) 90 – 120 cm
- longo (*long*) > 120 cm

Característica Br4: Folha: largura / *Characteristic Br4: Leaf: width*

Aproximadamente considera-se:

(In approach, we can consider / We can consider near by)

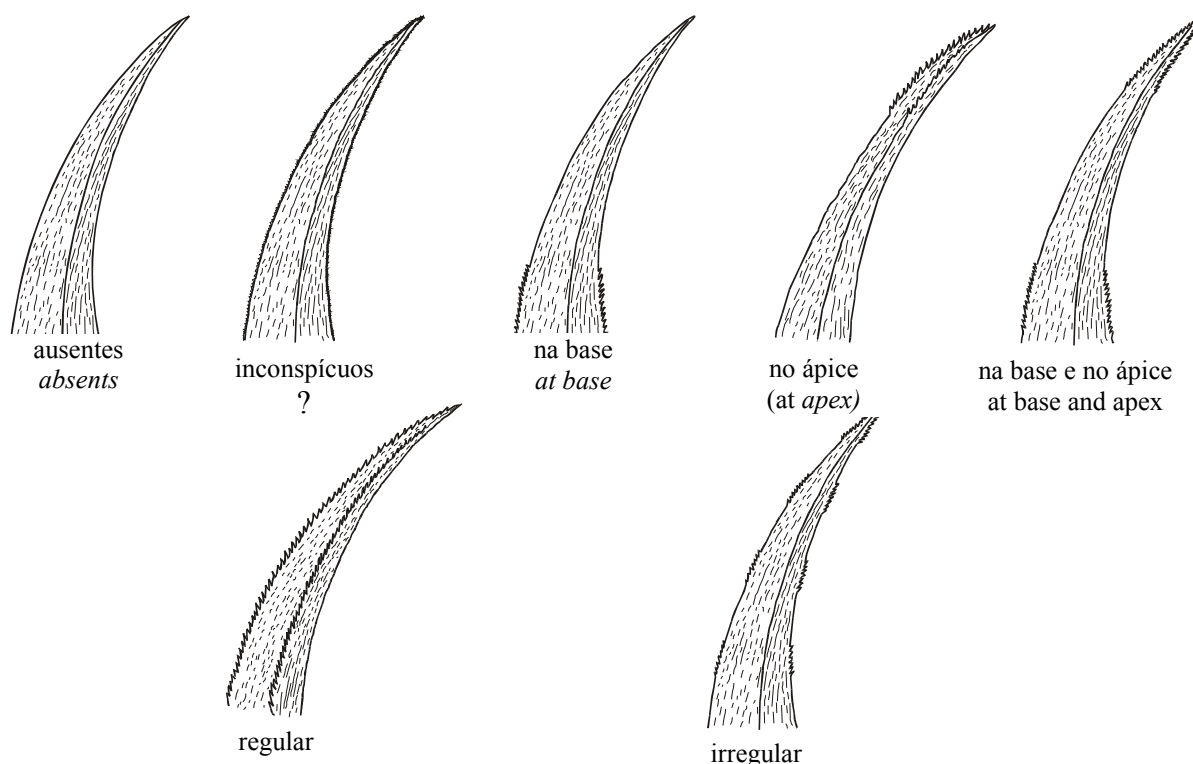
- estreita (*narrow*) < 6,0 cm
- média (*medium*) – 6,0 a 7,0 cm
- larga (*broad*) > 7,0 cm

Característica Br8: Folha: espinhos / Characteristic Br8: Leaf: spines

Característica Br9: Folha: distribuição dos espinhos na margem /
Characteristic Br9: Leaf: distribution of spines at margin

Inconspícuos são espinhos microscópicos que podem ser detectados através do tato. Passando-se a mão nas margens das folhas tem-se a sensação de se sentir uma lixa. (“Inconspícuos” are microscopic spines, which can be detected through the sense of touch. When we touch our hands at the margins of leaves, we feel that it’s like a sandpaper.)

São considerados espinhos conspícuos aqueles visíveis a olho nú. (“Conspícuos” are spines, which are visible with the naked eye.)



(Desenho adaptado por Maria da Conceição Borba)

Característica Br10: Inflorescência: quantidade de flores /

Characteristic Br10: Inflorescence: number of flowers

Aproximadamente considera-se:

(In approach, we can consider / We can consider near by)

- baixa (low) < 130
- média (medium) 130 - 170
- alta (high) > 170

Característica Br15: Flor: proporção da coloração branca na pétala /
Characteristic Br15: Flower: ratio of the white color in the petal

- Aproximadamente considera-se:
(*In approach, we can consider / We can consider near by*)
- baixa (*low*) < 30 %
 - média (*medium*) 30 – 60 %
 - alta (*high*) > 60 %

Característica 18: Flor: comprimento do estilete /
Characteristic Br18: Flower: length of style

- brevistilo: mais curto que os estames
shorter than the stamens
- equistilo: do mesmo comprimento dos estames
with the same length of the stamens
- longistilo: mais longo que os estames
longer than the stamens

Característica Br19: Rebentões: quantidade /
Characteristic Br19: Suckers: number

- Aproximadamente considera-se:
(*In approach, we can consider / We can consider near by*)
- baixa (*low*) < 1
 - média (*medium*) 1 - 2
 - alta (*high*) > 2

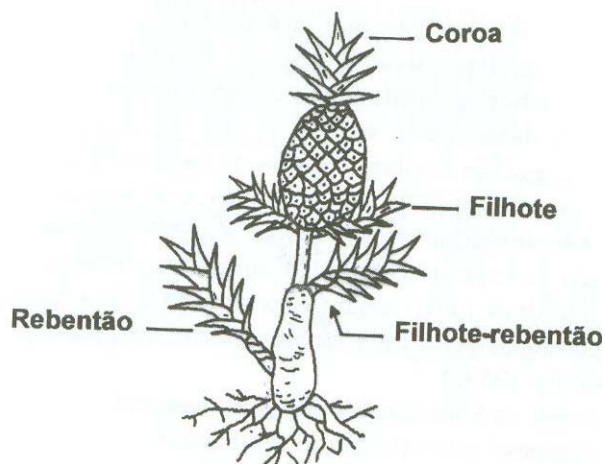
Característica Br20: Pedúnculo: comprimento / Characteristic Br20: Peduncle: length

- Aproximadamente considera-se:
(*In approach, we can consider / We can consider near by*)
- curto (*short*) < 18 cm
 - médio (*medium*) 18 – 28 cm
 - longo (*long*) > 28 cm

Característica Br21: Pedúnculo: diâmetro na porção mediana /
Characteristic Br21: Peduncle: diameter at the middle portion

- Aproximadamente considera-se:
(*In approach, we can consider / We can consider near by*)
- pequeno (*small*) < 2,5 cm
 - médio (*medium*) 2,5 – 3,5 cm
 - grande (*large*) > 3,5 cm

Característica Br22: Pedúnculo: quantidade de filhotes /
Characteristic Br22: Peduncle: number of slips



Aproximadamente considera-se:

- baixa (*low*) < 5
- média (*medium*) 5 – 10
- alta (*high*) > 10

Característica Br26: Fruto: comprimento. Medido da base até o topo sem considerar a coroa /
Characteristic Br26: Fruit: length. Measured from base to top without consider the crown

Aproximadamente considera-se:

(*In approach we can consider / We can consider near by*)

- curto (*short*) < 15 cm
- médio (*medium*) 15 – 20 cm
- longo (*long*) > 20 cm

Característica 27: Fruto: diâmetro basal / Characteristic Br27: Fruit: diameter of base

Aproximadamente considera-se:

(*In approach we can consider / We can consider near by*)

- pequeno (*small*) < 10 cm
- médio (*medium*) 10 – 12 cm
- grande (*large*) > 12 cm

Característica 29: Fruto: diâmetro apical / Characteristic Br29: Fruit: diameter of tip

Aproximadamente considera-se:

(*In approach we can consider / We can consider near by*)

- pequeno (*small*) < 6 cm
- médio (*medium*) 6 - 10 cm
- grande (*large*) > 10 cm

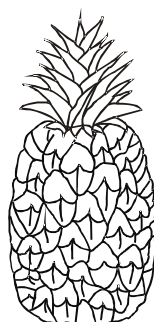
Característica Br30: Fruto: forma / Characteristic Br30: Fruit: shape



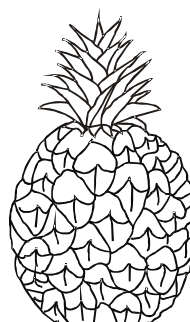
1
cônica
conic



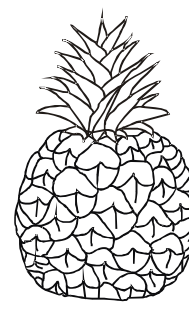
2
cônica a cilíndrica
conic to cylindric



3
cilíndrica
cylindric



4
elíptico
elliptic



5
globosa
global

Característica Br34: Fruto: quantidade de filhotes basais /
Characteristic Br34: Fruit: number of fruit basal slips

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- baixa (*low*) < 1
- média (*medium*) 1 – 2
- alta (*high*) > 2

Característica Br41: Fruto: diâmetro do eixo central /
Ad. Br41: Fruit: diameter of central axis

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- pequeno (*small*) < 1,5 cm
- médio (*medium*) 1,5 – 2,5 cm
- grande (*large*) > 2,5 cm

Característica Br42: Fruto: concentração de sólidos solúveis (graus Brix) /
Characteristic Br42: Fruit: concentration of soluble solids (Brix degrees)

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- baixo (*low*) < 13
- médio (*medium*) 13 – 16
- alto (*high*) > 16

Característica Br43: Fruto: acidez (titulada em percentagem) /
Characteristic Br43: Fruit: acidity (fixed in percentage)

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- baixa (*low*) < 0,5
- média (*medium*) 0,5 – 0,7
- alta (*high*) > 0,7

Característica Br46: Coroa: comprimento / Characteristic Br46: Crown: length

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- curto (*short*) < 15 cm
- médio (*medium*) 15 – 20 cm
- longo (*long*) > 20 cm

Característica Br47: Coroa: peso / Characteristic Br47: Crown: weight

Aproximadamente considera-se:

(In approach we can consider / We can consider near by)

- baixo (*low*) < 100 g
- médio (*medium*) 100 – 130 g
- alto (*high*) > 130 g

8.3 *The stage of development for the assessment*

The optimum stage of development for the assessment of each characteristic is indicated by a code in the first column of the Table of Characteristics:

- 1-T: at vegetative maturity growth stage, immediately before flower induction (or before flower emergence ?)
- 2-A: Anthesis stage
- 3-I: Immature fruit stage
- 4-M: Maturity stage.

The emergence of inflorescence should be invoked artificially about 36 weeks after plantation, with a variation of two weeks depending of place and varieties

8.4 *Appendix: Methods of measurements (pineapple juice) from France Cirad*

Juice

The juice is squeezed out from pineapple flesh and strained through muslin. It can be frozen to be used later.

Sugar content (character 85)

Sugar content (Brix value) is recorded via refractometer. It is given as a percentage (%Brix).

Free acid content (character 84)

Free acid content is determined by titration of 10 ml filtered juice with 0.1 NaOH with phenolphthaleine as indicator. The result is given in meq per 100 ml of juice (meq/100ml).

Ascorbic acid content (character 83)

Ascorbic acid content is determined by titration with 2,6-dichlorophenol-indophenol (DCPIP). It is compared to a control scale (see below). Measure is brought to 100 ml of juice and is given in mg/100ml.

Reagents

Sol 1 : Metaphosphoric acid 2 % / TCA 4 %

Dissolve 2 mg metaphosphoric acid and 4 mg trichloroacetic acid in 100 ml distilled water.

Sol 2 : DCPIP 250 mg/l

Dissolve 125 mg 2,6-dichlorophenol-indophenol in 500 ml warm distilled water, then filter

Add 104 mg sodium bicarbonate

Note: Dissolved DCPIP is unstable. Protect from light.

Sol 3 : Ascorbic acid control

Dissolve 50 mg ascorbic acid in 100 ml Sol 1 + 100 ml distilled water

Control

Ascorbic acid content (mg):	0	0.25	0.50	0.75	1.0	1.25
Sol 3 (ml)	0	1	2	3	4	5
Sol 1 (ml)	4	3.5	3	2.5	2	1.5
Distilled water (ml)	4	3.5	3	2.5	2	1.5

Titration

Add 4 ml Sol 1 to 4 ml juice. Pour slowly Sol 2 until pink coloration appears. Compare the volume poured to the control scale to determine the ascorbic acid content within 4 ml juice.

Note: if acid ascorbic measurement should be made later, add 4 ml Sol 1 to 4 ml juice immediately after it has been squeezed and strained (e.g. before freezing).

9. Literature

Py C., Lacoeylthe J.J., Teisson C. 1984. L=ananas, sa culture, ses produits. Collection techniques agricoles et productions tropicales. Editions Maisonneuve et Larose, Paris, 562 p.

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

- 4.1.1 **Seedling** []
(please state parent varieties)
- 4.1.2 Mutation, **selected clone** []
(please state parent variety)
- 4.1.3 Discovery and development []
(please state where and when discovered
and how developed)
- 4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

- 4.2.1 *In vitro* propagation []
- 4.2.2 Other []
(please provide details)

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: foliage attitude (1)		
erect // <i>semi erect (Br)</i>	Perola	3 []
semi-erect // <i>intermediate (Br)</i>	Cayenne	5 []
spreading // <i>open (Br)</i>	Perolera	7 []

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:
Characteristics	Example Varieties	Note	
5.2 Leaf: leaf edges aspect (piping/not piping) (14)			
piping	Manzana	1[]	
not piping	Singapore canning, Cayenne, Queen	2[]	
5.3 Leaf: aspect of not-piping leaf edges (15)			
spines along all margins	Mac gregor	1[]	
spines occur irregularly along both margins	Fina de hiero	2[]	
spines behind tip only	Champaka	3[]	
sand paper	Samba	4[]	
smooth	Singapore canning	5[]	
5.4 Slips: presence/absence (42)			
absent	Cayenne	1[]	
present	Queen, Perolera, Perola	9[]	
5.5 Fruit: shape when ripe (53)			
trapezoid, upside down	Singapore canning	1[]	
cylindrical	Perolera, <i>S.Cayenne</i>	2[]	
<i>cylindrical to conical (Br)</i>			
ovoid	Cayenne	3[]	
conical	Perola	4[]	
<i>elliptic (Br)</i>			
trapezoid		5[]	
globular	Red Spanish	6[]	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.6	Fruit: “skin (Br)?” predominant color when ripe (or Br: color of skin at the point to consume)		
(54)			
white cream	155 A	1[]	
green	147 A	2[]	
green and yellow =? <i>green with yellow spots (Br)</i>		3[]	
<i>light yellow (Br)</i>	<i>Perola</i>		
yellow	13 A	4[]	
golden yellow	21 A, <i>S.Cayenne</i>	5[]	
orange	32 A	6[]	
orange red	42 A	7[]	
red	53 A	8[]	
<i>purple (Br)</i>			
brown	200 A	9[]	
5.7	Fruit: eye profile		
(68)			
hollow or concave	Singapore canning	1[]	
flat	Perola	2[]	
slightly prominent	Rondon	3[]	
prominent	Queen	4[]	
5.8	Fruit/flesh: color		
(71)			
white or <i>white cream (Br)</i>	Perola (155A)	1[]	
pale yellow	Cayenne (11A)	2[]	
yellow	Perolera (13B)	3[]	
golden yellow	Queen (21A)	4[]	
<i>orange (Br)</i>			

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 your candidate variety
<i>Example</i>			
<p>Comments:</p>			

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

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

Yes [] No []

(If yes, please provide details)

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

Yes [] No []

(If yes, please provide details)

7.3 Other information

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

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [] No []

(b) Has such authorization been obtained?

Yes [] No []

If the answer to (b) is yes, please attach a copy of the authorization.

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

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