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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

DRAFT

CACTUS PEAR
and
XOCONOSTLES

UPOV Code: OPUNT_AMY; OPUNT_DUR; OPUNT_FIC; OPUNT_HEL;
OPUNT_HYP; OPUNT_JOC; OPUNT_LAS; OPUNT_LEU; OPUNT_MAT;
OPUNT_MEG; OPUNT_OLI; OPUNT_ROB; OPUNT_SPI; OPUNT_STR

Opuntia, Groups 1 & 2

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

prepared by an expert from Mexico

*to be considered by the Technical Committee at its forty-second session,
to be held in Geneva, Switzerland, from April 3 to 5, 2006*

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Opuntia</i> , Group 1	Cactus pear, Prickly pear	Figuier de Barbarie	Feigenkaktus	Chumbera, Nopal tunero, Tuna
<i>Opuntia</i> , Group 2	Xoconostles	Xoconostles	Xoconostles	Xoconostles

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 the following *Opuntia* groups and species (*Cactaceae*):

Group 1: Cactus Pear

Opuntia amyclaea Tenore, *O. ficus-indica* (L.) Mill., *O. streptacantha* Lemaire, *O. megacantha* Salm-Dyck, *O. duranguensis* Britton et Rose, *O. lasyacantha* Pfeiffer, *O. robusta* Wendland, *O. hyptiacantha* Weber

Group 2: Xoconostles

Opuntia joconostle Weber, *O. matudae* Sheinvar, *O. oligacantha* Sheinvar, *O. leucotrica* DC, *O. heliabravoana* Sheinvar, *O. spinulifera* Sheinvar.

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 three-year-old plants or, if accepted by the competent authority, branches including three successive cladodes.

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

5 three-year old plants, or if accepted by the competent authority,

7 branches which include 3 successive cladodes,
each sufficient to propagate 5 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*

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

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 5 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 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2. In the case of fruit characteristics, the observations should be made on 20 fruits.

3.6 *Additional Tests*

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative

manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 *Uniformity*

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed.

4.3 *Stability*

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

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Cladode: color of areoles (characteristic 14);
- (b) Fruit: thickness of peel (characteristic 44);
- (c) Seed: size (characteristic 54);
- (d) Flowering habit (characteristic 59);
- (e) Time of harvest maturity (characteristic 60).

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. A table of synonyms of the example varieties is provided in Chapter 8.3

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

QN: Quantitative characteristic – see Chapter 6.3

PQ: Pseudo-qualitative characteristic – see Chapter 6.3

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

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

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	Plant: growth habit	Plante: port	Pflanze: Wuchsform	Planta: porte		
(+)						
PQ	upright	dressé	aufrecht	erguido	Cardón	1
	spreading	étalé	breitwüchsig	extendido	Chapeada, Cristalina	2
	decumbent	décombant	niederliegend	decumbente	Pabellón, Rojo Pelón	3
	drooping	retombant	überhängend	colgante	Sanjuanera	4
2.	Plant: height	Plante: hauteur	Pflanze: Höhe	Planta: altura		
QN	short	basse	niedrig	baja	Pico Chulo, Torreoja	3
	medium	moyenne	mittel	media	Esmeralda, Rojo Vigor	5
	tall	haute	hoch	alta	Oreja de Elefante	7
3.	Plant: width	Plante: largeur	Pflanze: Breite	Planta: anchura		
QN	narrow	étroite	schmal	estrecha	Copena F-1, Rojo Lirio	3
	medium	moyenne	mittel	media	Cristalina, Esmeralda	5
	broad	large	breit	ancha	Montesa, Reyna	7
4.	Cladode: length	Cladode: longueur	Kladodium: Länge	Cladodio: longitud		
(+)						
QN (a)	short	courte	kurz	corta	Pico Chulo, Sanjuanera, Tapón de Mayo	3
	medium	moyenne	mittel	media	Rojo Pelón, Tapón Aguanoso	5
	long	longue	lang	larga	Cristalina, Sangre de Toro	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	Cladode: width	Cladode: largeur	Kladodium: Breite	Cladodio: anchura		
(+)						
QN (a)	narrow	étroite	schmal	estrecha	Pico Chulo, Rojo Lirio	3
	medium	moyenne	mittel	media	Milpa Alta, Cristalina	5
	broad	large	breit	ancha	Oreja de Elefante	7
6.	Cladode: length/width ratio	Cladode: rapport longueur/largeur	Kladodium: Verhältnis Länge/Breite	Cladodio: relación longitud/anchura		
QN (a)	small	petit	klein	pequeña	Oreja de Elefante, Rojo Pelón	3
	medium	moyen	mittel	media	Miquihuana, Villanueva	5
	large	grand	groß	grande	Copena T-3, Reyna	7
7.	Cladode: shape	Cladode: forme	Kladodium: Form	Cladodio: forma		
(*)						
(+)						
PQ (a)	narrow elliptic	elliptique étroite	schmal elliptisch	elíptico estrecho	Copena F-1, Tlaconopal	1
	medium elliptic	elliptique moyenne	mittel elliptisch	elíptico medio	Ixtapa	2
	broad elliptic	elliptique large	breit elliptisch	elíptico ancho	Milpa Alta	3
	circular	circulaire	kreisförmig	circular	Tapón Aguanoso	4
	rhombic	losangique	rautenförmig	rómbico	Atlixco, Trompa de Cochino	5
	narrow obovate	obovale étroite	schmal verkehrt eiförmig	oboval estrecho	Rubí Reyna	6
	broad obovate	obovale large	breit verkehrt eiförmig	oboval ancho	Fafayuca	7
8.	Cladode: thickness	Cladode: épaisseur	Kladodium: Dicke	Cladodio: grosor		
(*)						
QN (a)	thin	fine	dünn	delgado	Burrona, Copena T-2, Montesa	3
	medium	moyenne	mittel	medio	Memelo	5
	thick	épaisse	dick	grueso	Pico Chulo, Rubí Reyna	7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
9.	Cladode: color	Cladode: couleur	Kladodium: Farbe	Cladodio: color		
PQ (a)	yellow green	vert jaunâtre	gelbgrün	verde amarillento	Cristalina, Reyna, Rojo Pelón	1
	light green	vert clair	hellgrün	verde claro	Milpa Alta	2
	medium green	vert moyen	mittelgrün	verde medio	Blanca Pepina	3
	dark green	vert foncé	dunkelgrün	verde oscuro	Morado Jalpa, Roja San Martín	4
	bluish green	vert bleuâtre	bläulichgrün	verde azulado	Tapón de Mayo	5
10.	Cladode: waxiness	Cladode: pruine	Kladodium: Wachsschicht	Cladodio: cerosidad		
QN (a)	very weak	très faible	sehr gering	muy débil	Tlaconopal	1
	weak	faible	gering	débil	Copena T-5	3
	medium	moyenne	mittel	media	Cristalina	5
	strong	forte	stark	fuerte	Copo de Nieve	7
11.	Cladode: pubes- cence of surface	Cladode: pilosité de la surface	Kladodium: Behaarung der Oberfläche	Cladodio: pubescencia de la superficie		
QL (a)	absent	absente	fehlend	ausente	Milpa Alta	1
	present	présente	vorhanden	presente	Cuaresmeño, Valterrilla	9
12.	Cladode: undula- tion of margin	Cladode: ondulation du bord	Kladodium: Wellung des Randes	Cladodio: ondulación del margen		
QL (a)	absent	absente	fehlend	ausente	Reyna	1
	present	présente	vorhanden	presente	Bola de Masa, Oreja de Elefante	9
13.	Cladode: number of areoles in central row	Cladode: nombre d'aréoles dans la rangée centrale	Kladodium: Anzahl Areolen in der mittleren Reihe	Cladodio: número de aréolas en la hilera central		
QN (a)	few	faible	gering	bajo	Cristalina, Pico Chulo, Tapón de Mayo	3
(b)	medium	moyen	mittel	medio	Amarillo Plátano, Copena T-2, Rubi Reyna	5
	many	important	groß	alto	Villanueva, Rojo San Juan	7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
14. (*)	Cladode: color of areoles	Cladode: couleur des aréoles	Kladodium: Farbe der Areolen	Cladodio: color de las aréolas		
PQ	(a) grey	grises	grau	gris	Milpa Alta, Reyna	1
	(b) yellow brown	marron jaune	gelbbraun	marrón amarillento	Burrona	2
	brown	marron	braun	marrón	Chaveña	3
	black	noires	schwarz	negro	Cardón	4
15. (*)	Cladode: number of spines per areole	Cladode: nombre d'épines par aréole	Kladodium: Anzahl Stacheln pro Areole	Cladodio: número de espinas por aréola		
QN	(a) none or very few	aucune ou très rares	keine oder sehr wenige	ninguna o muy bajo	Pabellón, Rojo Pelón, Rojo Vigor	1
	(b) few	rares	wenige	bajo	Rojo Lirio, Rojo San Martín	3
	medium	moyennes	mittel	medio	Cristalina, Esmeralda, Torreoja	5
	many	nombreuses	viele	alto	Sanjuanera, Villanueva	7
	very many	très nombreuses	sehr viele	muy alto	Reyna	9
16.	Cladode: length of longest spine	Cladode: longueur de l'épine la plus longue	Kladodium: Länge des längsten Stachels	Cladodio: longitud de la espina más larga		
QN	(a) short	courte	kurz	corta	Memelo, Pico Chulo	3
	(b) medium	moyenne	mittel	media	Fafayuca, Rubí Reyna	5
	long	longue	lang	larga	Tapón Aguanoso	7
17.	Spine: main color	Épine: couleur principale	Stachel: Hauptfarbe	Espina: color principal		
PQ	(a) grey	grise	grau	gris	Cardona	1
	(b) white	blanche	weiß	blanco	Reyna	2
	yellow	jaune	gelb	amarillo	Duraznillo, Tapón Aguanoso	3
	brown	marron	braun	marrón	Rosa de Castilla, San Pedreña	4

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18.	Spine: number of colors	Épine: nombre de couleurs	Stachel: Anzahl Farben	Espina: número de colores		
QL	(a) one	une	eine	uno	Reyna, Rosa de Castilla, Tapón Aguanoso	1
	(b) two	deux	zwei	dos	Cardona, Chapeado, Cristalina	2
19.	Spine: surface	Épine: surface	Stachel: Oberfläche	Espina: superficie		
(+)						
PQ	(a) smooth	lisse	glatt	lisa	Amarillo	1
	(b) grooved	cannelée	gerieft	acanalada	Reyna	2
	prickled	épineuse	beborstet	con púas	Tapón Aguanoso	3
20.	Central spine: attitude	Aiguillon central: port	Zentraler Stachel: Haltung	Espina central: porte		
(+)						
QN	(a) erect	érigé	aufrecht	erecto	Fafayuca	1
	(b) semi-erect	demi-érigé	halbaufrecht	semierecto	Tuna Morada II	3
	horizontal	horizontal	waagrecht	horizontal	Cardón	5
21.	Central spine: flexibility	Aiguillon central: flexibilité	Zentraler Stachel: Biessamkeit	Espina central: flexibilidad		
PQ	(a) flexible	souple	biegsam	flexible	Cristalina	1
	(b) firm	ferme	fest	firme	Reyna	2
	brittle	fragile	zerbrechlich	quebradiza	Burrona	3
22.	Central spine: curvature (excluding base)	Aiguillon central: courbure (sauf la base)	Zentraler Stachel: Biegung (ohne Basis)	Espina central: curvatura (excluida la base)		
(+)						
PQ	(a) absent	absente	fehlend	ausente	Burra, Sanjuanera	1
	(b) present	présente	vorhanden	presente	Cardón de Castilla	9
23.	Central spine: twisting	Aiguillon central: torsion	Zentraler Stachel: Verdrehung	Espina central: torsión		
(+)						
QL	(a) absent	absente	fehlend	ausente	Burra, Burrona	1
	(b) present	présente	vorhanden	presente	Rubí Reyna, Sanjuanera	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24.	Central spine: shape in dorsal view	Aiguillon central: forme en vue dorsale	Zentraler Stachel: Form in der dorsalen Ansicht	Espina central: forma en vista dorsal		
QL	(a) aciculate	en forme d'aiguille	nadelförmig	aciculada	Burra, Cuaresmeño	1
	(b) narrow triangular	triangulaire étroite	schmal dreieckig	triangular estrecha	Montesa	2
25.	Central spine: shape in cross section	Aiguillon central: forme en vue transversale	Zentraler Stachel: Form im Querschnitt	Espina central: forma en la sección transversal		
PQ	(a) elliptic	elliptique	elliptisch	elíptica	Amarilla	1
	(b) circular	circulaire	rund	circular	Montesa	2
	triangular	triangulaire	dreieckig	triangular	Pachón	3
26. (*)	Cladode: number of glochides	Cladode: nombre de glochides	Kladodium: Anzahl von Widerhäkchen	Cladodio: número de gloquidas		
QN	(a) none or very few	aucune ou très rares	keine oder sehr wenige	ninguna o muy pocas	Rojo Pelón	1
	(b) few	rares	wenige	pocas	Reyna	2
	many	nombreuses	viele	abundantes	Montesa, Tuna Mantequilla	3
27.	Cladode: color of glochides	Cladode: couleur des glochides	Kladodium: Farbe der Widerhäkchen	Cladodio: color de las gloquidas		
PQ	(a) yellow	jaunes	gelb	amarillo	Tapón Aguanoso	1
	(b) brown	marron	braun	marrón	Cristalina, Reyna, Rojo Pelón	2
28.	Cladode: number of flowers	Cladode: nombre de fleurs	Kladodium: Anzahl Blüten	Cladodio: número de flores		
QN	(a) few	faible	gering	bajo	Copena Z-1, Fafayuca	3
	medium	moyen	mittel	medio	Cuaresmeño, Memelo	5
	many	élevé	groß	alto	Villanueva	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29.	Flower: length	Fleur: longueur	Blüte: Länge	Flor: longitud		
(+)						
QN	(c) short	courte	kurz	corta	Copena Z-1, Pico Chulo	3
	medium	moyenne	mittel	media	Burrona, Colorada	5
	long	longue	lang	larga	Mango, Sanjuanera	7
30.	Flower: color of perianth	Fleur: couleur du périanthe	Blüte: Farbe der Blütenhülle	Flor: color del perianto		
(*)						
PQ	(c) greenish yellow	jaune verdâtre	grünlichgelb	amarillo verdoso	Cardón, Duraznillo	1
	yellow	jaune	gelb	amarillo	Tapón Macho	2
	brownish yellow	jaune brunâtre	bräunlichgelb	amarillo marrón	Rojo Pelón	3
	orange	orange	orange	anaranjado	Chapeada, Reyna	4
	orange red	rouge orangé	orangerot	rojo anaranjado	Roja San Martín, Tuna Rosa	5
31.	Flower: color of style	Fleur: couleur du style	Blüte: Farbe des Griffels	Flor: color del estilo		
(*)						
(+)						
PQ	(c) green	vert	grün	verde	Duraznillo	1
	white	blanc	weiß	blanco	Montesa, Tapón de Mayo	2
	yellow	jaune	gelb	amarillo	Cardón Aguanoso	3
	pink	rose	rosa	rosa	Morada, Pico Chulo	4
	red	rouge	rot	rojo	Pabellón, Rojo Pelón	5
32.	Flower: number of stigma lobes	Fleur: nombre de lobes du stigmat	Blüte: Anzahl Narbenlappen	Flor: número de lóbulos del estigma		
(+)						
QN	(c) few	faible	gering	bajo	Atlixco, Burrona Larga	3
	medium	moyen	mittel	medio	Rubí Reyna, Villanueva	5
	many	élevé	groß	alto	Naranjón Legítimo	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33.	Flower: color of stigma lobe	Fleur: couleur du lobe du stigmate	Blüte: Farbe des Narbenlappens	Flor: color del lóbulo del estigma		
(+)						
QL	(c) yellow	jaune	gelb	amarillo	Morada Jalpa	1
	green	vert	grün	verde	Cristalina, Reyna	2
34.	Fruit: length	Fruit: longueur	Frucht: Länge	Fruto: longitud		
(*)						
QN	(d) short	courte	kurz	corta	Amarilla Santa Inés, Sangre de Toro	3
	medium	moyenne	mittel	media	Fafayuca, Reyna	5
	long	longue	lang	larga	Burrona, Cristalina	7
35.	Fruit: maximum diameter	Fruit: diamètre maximum	Frucht: maximaler Durchmesser	Fruto: diámetro máximo		
(*)						
QN	(d) narrow	étroit	schmal	estrecho	Cambray, Memelo	3
	(e) medium	moyen	mittel	medio	Reyna, Solferino	5
	broad	large	breit	ancho	Burrona, Cristalina, Tapón de Mayo	7
36.	Fruit: ratio length/maximum diameter	Fruit: rapport longueur/diamètre maximum	Frucht: Verhältnis Länge/maximaler Durchmesser	Fruto: relación longitud/diámetro máximo		
QN	(d) small	petit	klein	pequeña	Rojo Papas, Tapón de Mayo	3
	(e) medium	moyen	mittel	media	Burrona, Concha de Oro	5
	large	grand	groß	grande	Amarilla Plátano, Montesa	7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
37. (+)	Fruit: shape in longitudinal section	Fruit: forme en section longitudinale	Frucht: Form im Längsschnitt	Fruto: forma en sección longitudinal		
PQ (d)	oblong	oblong	rechteckig	oblonga	Copena 17, Torreoja	1
	narrow elliptic	elliptique étroit	schmal elliptisch	elíptica estrecha	Rubí Reyna	2
	medium elliptic	elliptique moyen	mittel elliptisch	elíptica media	Reyna	3
	circular	circulaire	kreisförmig	circular	Cardón	4
	oblate	aplatis	breitrund	achatada	Tapón de Mayo	5
	obovate	obovale	verkehrt eiförmig	oboval	Roja Jalpa	6
38.	Fruit: density of areoles	Fruit: densité des aréoles	Frucht: Dichte der Areolen	Fruto: densidad de aréolas		
QN (b)	sparse	lâche	locker	baja	Cristalina, Rojo Jalpa	3
(d)	medium	moyenne	mittel	media	Montesa, Reyna	5
	dense	dense	dicht	alta	Rojo Lirio, Torreoja	7
39. (*)	Fruit: number of glochides	Fruit: nombre de glochides	Frucht Anzahl Widerhäkchen	Fruto: número de gloquidas		
QN (b)	few	faible	gering	bajo	Tapón de Mayo	3
(d)	medium	moyen	mittel	medio	Cristalina	5
	many	élevé	groß	alto	Montesa, Reyna, Rubí Reyna	7
40. (*)	Fruit: color of glochides	Fruit: couleur des glochides	Frucht: Farbe der Widerhäkchen	Fruto: color de las gloquidas		
PQ (b)	yellow	jaunes	gelb	amarillo	Blanca San José, Camueso, Tuna Mansa	1
(d)	brown	marron	braun	marrón	Amarilla, Amarilla San Nicolás, Pico Chulo	2

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
41.	Fruit: length of stalk	Fruit: longueur du pédoncule	Frucht: Länge des Stiels	Fruto: longitud del pedúnculo		
(+)						
QN (d)	short	court	kurz	corta	Amarillo Plátano, Solferino	3
	medium	moyen	mittel	media	Montesa, Pico Chulo	5
	long	long	lang	larga	Cristalina	7
42.	Fruit: depression of receptacle scar	Fruit: dépression de la cicatrice du réceptacle	Frucht: Einsenkung des Fruchtbodenansatzes	Fruto: depresión de la cicatriz del receptáculo		
(+)						
QN (d)	absent or slightly depressed	nulle ou légèrement déprimée	fehlend oder leicht eingesenkt	ausente o ligeramente deprimida	Reyna, Torreoja	1
	moderately depressed	modérément déprimée	mäßig eingesenkt	moderadamente deprimida	Memelo, Pico Chulo	2
	strongly depressed	fortement déprimée	stark eingesenkt	fuertemente deprimida	Chapeada, Roja San Martin	3
43.	Fruit: diameter of receptacle scar	Fruit: diamètre de la cicatrice du réceptacle	Frucht: Durchmesser des Fruchtbodenansatzes	Fruto: diámetro de la cicatriz del receptáculo		
QN (d)	small	petit	klein	pequeño	Copena 2, Tuna Rosa	3
	medium	moyen	mittel	medio	Amarillo Plátano, Cambray	5
	large	grand	groß	grande	Cristalina, Pico Chulo, Tapón de Mayo	7
44.	Fruit: thickness of peel	Fruit: épaisseur de la peau	Frucht: Dicke der Schale	Fruto: espesor de la cáscara		
(*)						
QN (d)	thin	fine	dünn	delgado	Amarilla San José, Montesa, Reyna	3
	(e) medium	moyenne	mittel	medio	Rojo Lirio, Rojo Pelón, Tapón de Mayo	5
	thick	épaisse	dick	grueso	Caidilla Legítima	7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
45.	Fruit: weight of peel	Fruit: poids de la peau	Frucht: Gewicht der Schale	Fruto: peso de la cáscara		
QN (d)	light	léger	leicht	ligero	Roja Suanjuanera, Tuna Rosa	3
	medium	moyen	mittel	medio	Chapeada, Natalia	5
	heavy	lourd	schwer	pesado	Montesa, Torreoja	7
46.	Fruit: weight of flesh	Fruit: poids de la chair	Frucht: Gewicht des Fleisches	Fruto: peso de la pulpa		
QN (d)	very light	très léger	sehr leicht	muy ligero	Cambray, Cuaresmeño	1
	light	léger	leicht	ligero	Morada, Zarca	3
	medium	moyen	mittel	medio	Fafayuca, Solferino	5
	heavy	lourd	schwer	pesado	Montesa, Rojo Pelón	7
	very heavy	très lourd	sehr schwer	muy pesado	Burrona, Cristalina	9
47.	Fruit: ratio of weight of flesh/peel	Fruit: rapport poids de la chair/poids de la peau	Frucht: Verhältnis Gewicht des Fleisches/der Schale	Fruto: relación peso de la pulpa/peso de la cáscara		
QN (d)	small	petit	klein	pequeña	Cardón, Trompa de Cochino	3
	medium	moyen	mittel	media	Gavia, Tapón Aguanoso	5
	large	grand	groß	grande	Blanca San José, Rojo Pelón	7
48.	Fruit: evenness of color of surface	Fruit: uniformité de la couleur de la surface	Frucht: Gleichmäßigkeit der Farbe der Oberfläche	Fruto: uniformidad del color de la superficie		
QL (d)	even	uniforme	gleichmäßig	uniforme	Burrona, Cristalina	1
	uneven	irrégulière	ungleichmäßig	irregular	Chapeado	2

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. (*)	Fruit: main color of surface	Fruit: couleur principale de la surface	Frucht: Hauptfarbe der Oberfläche	Fruto: color principal de la superficie		
PQ (d)	white	blanche	weiß	blanco	Blanca Platanillo	1
	light green	vert clair	hellgrün	verde claro	Gavia	2
	medium green	vert moyen	mittelgrün	verde medio	Esmeralda	3
	dark green	vert foncé	dunkelgrün	verde oscuro	Burrona, Reyna	4
	yellow	jaune	gelb	amarillo	Amarilla Plátano	5
	orange	orange	orange	anaranjado	Montesa, Pico Chulo	6
	pink	rose	rosa	rosa	Memelo	7
	medium red	rouge moyen	mittelrot	rojo medio	Rojo Pelón, Rubi Reyna	8
	dark red	rouge foncé	dunkelrot	rojo oscuro	Cardón	9
	purple	pourpre	purpurn	púrpura	Morada Jalpa, Roja San Martín, Tapón Aguanoso	10
50. (*)	Fruit: color of flesh	Fruit: couleur de la chair	Frucht: Farbe des Fleisches	Fruto: color de la pulpa		
PQ (d)	light green	vert clair	hellgrün	verde claro	Cristalina, Esmeralda, Reyna	1
	medium green	vert moyen	mittelgrün	verde medio	Burrona	2
	yellow	jaune	gelb	amarillo	Montesa	3
	orange	orange	orange	anaranjado	Pico Chulo	4
	pink	rose	rosa	rosa	Meloncillo Rosa, Memelo	5
	red	rouge	rot	rojo	Rojo Pelón, Rubi Reyna	6
	purple	pourpre	purpurn	púrpura	Liria, Morada Jalpa, Roja San Martín	7
51.	Fruit: firmness of flesh	Fruit: fermeté de la chair	Frucht: Festigkeit des Fleisches	Fruto: firmeza de la pulpa		
QN (d)	soft	molle	weich	blanda	Memelo	3
	medium	moyenne	mittel	media	Cristalina	5
	firm	ferme	fest	firme	Fafayuca	7

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
52.	Fruit: juiciness of flesh	Fruit: jutosité de la chair	Frucht: Saftigkeit des Fleisches	Fruto: jugosidad de la pulpa		
QN (d)	low	faible	gering	baja	Amarilla Plátano, Memelo	3
	medium	moyenne	mittel	media	Reyna	5
	high	forte	hoch	alta	Burrona, Cristalina, Fafayuca	7
53. (*)	Fruit: number of fully developed seeds	Fruit: nombre de graines complètement développées	Frucht: Anzahl vollentwickelter Samen	Fruto: número de semillas completamente desarrolladas		
QN (d)	few	faible	gering	bajo	Roja Sanjuanera	3
	medium	moyen	mittel	medio	Fafayuca, Solferino	5
	many	élevé	groß	alto	Tapón de Mayo, Cristalina	7
54. (*)	Seed: size	Graine: taille	Samen: Größe	Semilla: tamaño		
QN (d)	small	petite	klein	pequeño	Cardón, Cascarona, Curesmeño	3
	medium	moyenne	mittel	medio	Pico Chulo, Reyna	5
	large	grande	groß	grande	Blanca San José, Burrona, Chapeada	7
55. (*) (+)	Fruit: number of abortive seeds	Fruit: nombre de graines avortées	Frucht: Anzahl verkümmerter Samen	Fruto: número de semillas abortivas		
QN (d)	none or very few	aucune ou très rares	keine oder sehr wenige	ninguna o muy pocas	Memelo, Solferino	1
	few	rares	wenige	pocas	Amarilla Plátano, Montesa	3
	medium	moyennes	mittel	media	Burrona, Chapeada, Cristalina	5
	many	nombreuses	viele	abundantes	Blanca Caldera	7
	very many	très nombreuses	sehr viele	muy abundantes	Blanca San José, Copena 2	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
56.	Fruit: total soluble solids	Fruit: teneur en matières solubles	Frucht: Gesamtgehalt an löslicher Trockensubstanz	Fruto: contenido total de sólidos solubles		
QN	(d) low	faible	gering	bajo	Duraznilla	3
	(e) medium	moyenne	mittel	medio	Amarillo Plátano, Burrona	5
	high	forte	hoch	alto	Copena L-12, Fafayuca, Rojo Pelón	7
57.	Fruit: acidity	Fruit: acidité	Frucht: Säure	Fruto: acidez		
QN	(d) low	faible	gering	baja	Blanca Larga	3
	(e) medium	moyenne	mittel	media	Fafayuca	5
	high	élevée	hoch	alta	Blanca de Castilla	7
58. (*)	Time of beginning of flowering	Époque du début de la floraison	Zeitpunkt des Blühbeginns	Época de comienzo de la floración		
QN	early	précoce	früh	temprana	Sanjuanera, Tapón Aguanoso	3
	medium	moyenne	mittel	media	Pico Chulo, Reyna, Rojo Pelón	5
	late	tardive	spät	tardía	Burrona, Charola, Cristalina	7
59. (*)	Flowering habit	Floraison	Blühverhalten	Tipo de floración		
QL	once flowering	fleurit une fois	einmal blühend	una floración	Cristalina, Reyna, Rojo Pelón	1
	twice flowering	fleurit deux fois	zweimal blühend	dos floraciones	Cuaresmeño	2

	English	français	deutsch	español	Example Varieties Exemples Beispielsorten Variedades ejemplo	Note/ Nota
60. (*) (+)	Time of harvest maturity	Époque de maturité de récolte	Zeitpunkt der Erntereife	Época de madurez para la cosecha		
QN	very early	très précoce	sehr früh	muy temprana	Tapón de Mayo	1
	early	précoce	früh	temprana	Tapón Aguanoso	3
	medium	moyenne	mittel	media	Montesa, Pico Chulo, Reyna	5
	late	tardive	spät	tardía	Burrona, Esmeralda, Fafayuca	7
	very late	très tardive	sehr spät	muy tardía	Charola, Chaveña	9
61.	Duration of harvesting period of fruit	Durée de la période de récolte du fruit	Dauer der Periode der Fruchternte	Duración del período de cosecha del fruto		
QN	short	courte	kurz	corta	Chapeada, Torreoja	3
	medium	moyenne	mittel	media	Pico Chulo, Reyna	5
	long	longue	lang	larga	Burrona	7

8. Explanations on the Table of Characteristics

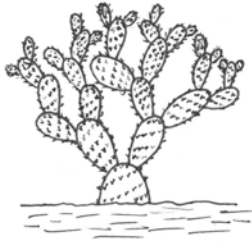
8.1 *Explanations covering several characteristics*

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

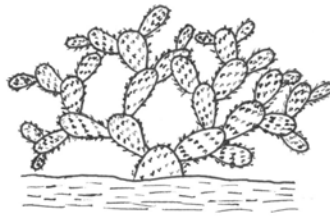
- (a) Cladodes: Unless otherwise stated all observations on the cladode should be made on mature cladodes, one to two years old.
- (b) Areoles, spines and glochides: Unless otherwise stated, all observations on the areole, spine and glochide should be made on intact cladodes or intact fruits as appropriate.
- (c) Flower: Unless otherwise stated all observations on the flower should be made at the peak of flowering time. All observations on the flower should be made at the first day of opening.
- (d) Fruit: All observations on the fruit should be made on 20 intact fruits which are fully mature for consumption.
- (e) Fruit diameter/thickness of peel/acidity/total soluble solids: The observations of fruit diameter, thickness of peel, acidity and total soluble solids should be made in the middle part of the fruit. For total soluble solids the middle part of the fruit must be used with the help of a refractometer.

8.2 *Explanations for individual characteristics*

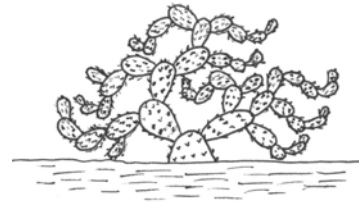
Ad. 1: Plant: growth habit



1
upright



2
spreading



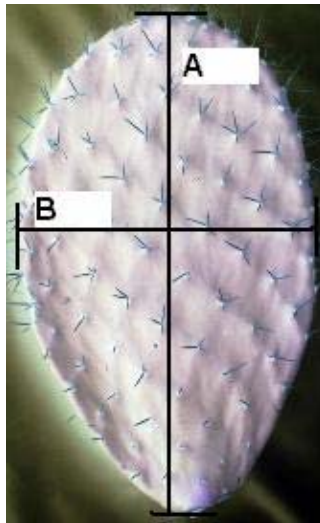
3
decumbent



4
drooping

Ad. 4: Cladode: length

Ad. 5: Cladode: width



A= length
B= width

Ad. 7: Cladode: shape



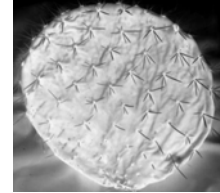
1
narrow elliptic



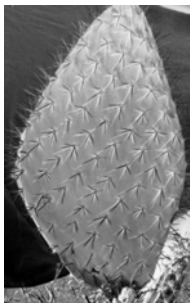
2
medium elliptic



3
broad elliptic



4
circular



5
rhombic



6
narrow obovate



7
broad obovate

Ad. 19: Spine: surface



1
smooth



2
grooved



3
prickled

Ad. 20: Central spine: attitude



1
erect

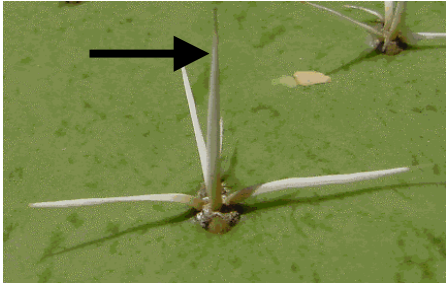


3
semi-erect



5
horizontal

Ad. 22: Central spine: curvature (excluding base)



1
absent



9
present

Ad. 23: Central spine: twisting



1
absent



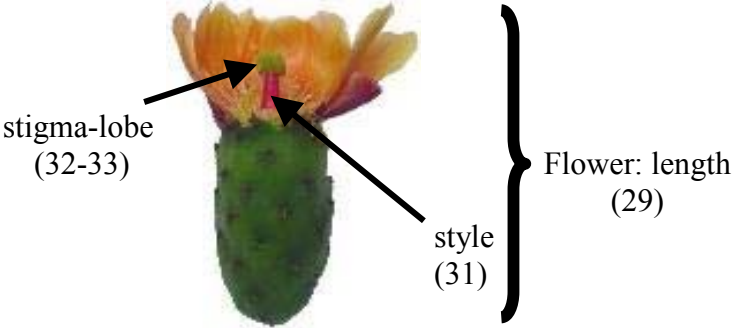
9
present

Ad. 29: Flower: length

Ad. 31: Flower: color of style

Ad. 32: Flower: number of stigma lobes

Ad. 33: Flower: color of stigma lobe



Ad. 37: Fruit: shape in longitudinal section



1
oblong



2
narrow elliptic



3
medium elliptic



4
circular



5
oblate

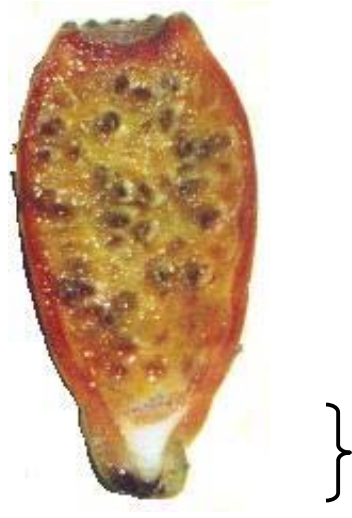


6
obovate

Ad. 41: Fruit: length of stalk



3
short

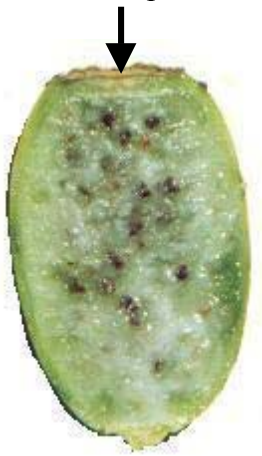


5
medium



7
long

Ad. 42: Fruit: depression of receptacle scar



1
absent or slightly depressed



2
moderately depressed



3
strongly depressed

Ad. 55: Fruit: number of abortive seeds

Absolute number to be observed, rather than the proportion in relation to the number of fully developed seeds.

Ad. 60: Time of harvest maturity

The time of harvest should be considered to be when the fruit flesh has reached a stable total soluble solids content, measured with a refractometer.

8.3 *Synonyms of Example Varieties*

Example Varieties	Synonym(s)
Reyna	Alfajayucan, Tuna Blanca, Taxa-kähä
Montesa	Amarilla Montesa, Monteza, Amarilla Huesona, Miquihuana
Esmeralda	COPENA XXA
Fafayuca	Fafayuco, Octubreña
Torroja	Torroja, Frida, Frieda, COPENA XXXA
Milpa Alta	Tuna Morada
Pico Chulo	Naranjona, Apastillada, Copo de Oro
Tuna Mansa	Blanca

9. Literature

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 <i>Botanical Name</i>	<input style="width: 100%;" type="text" value="Opuntia, Group 1"/> Please state species:	[]
Common Name	<input style="width: 100%;" type="text" value="Cactus Pear"/>	
1.2 <i>Latin Name</i>	<input style="width: 100%;" type="text" value="Opuntia, Group 2"/> Please state species:	[]
Common Name	<input style="width: 100%;" type="text" value="Xoconostles"/>	
2. Applicant		
Name	<input style="width: 100%;" type="text"/>	
Address	<input style="width: 100%; height: 80px;" type="text"/>	
Telephone No.	<input style="width: 100%;" type="text"/>	
Fax No.	<input style="width: 100%;" type="text"/>	
E-mail address	<input style="width: 100%;" type="text"/>	
Breeder (if different from applicant)	<input style="width: 100%;" type="text"/>	

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)

Breeder's reference

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

4.1 Breeding scheme

Variety resulting from::

4.1.1 Crossing

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

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

(c) unknown cross []

4.1.2 Mutation []
(please state parent variety)

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

4.1.4 Other []
(please provide details)

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) other (state method) []

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 Cladode: color of areoles (14)		
grey	Milpa Alta, Reyna	1[]
yellow brown	Burrona	2[]
brown	Chaveña	3[]
black	Cardón	4[]
5.2 Fruit: thickness of peel (44)		
thin	Amarilla San José, Montesa, Reyna	3[]
medium	Rojo Lirio, Rojo Pelón, Tapón de Mayo	5[]
thick	Caidilla Legítima	7[]
5.3 Seed: size (54)		
small	Cardón, Cascarona, Curesmeño	3[]
medium	Pico Chulo, Reyna	5[]
large	Blanca San José, Burrona, Chapeada	7[]

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Characteristics	Example Varieties	Note
5.4 Flowering habit (59)		
once flowering	Cristalina, Reyna, Rojo Pelón	1[]
twice flowering	Cuaresmeño	2[]
5.5 Time of harvest maturity (60)		
very early	Tapón de Mayo	1[]
early	Tapón Aguanoso	3[]
medium	Montesa, Pico Chulo, Reyna	5[]
late	Burróna, Esmeralda, Fafayuca	7[]
very late	Charola, Chaveña	9[]

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>	<i>Fruit: length</i>	<i>short</i>	<i>medium</i>

Comments:

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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.

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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".

.....

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]