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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

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

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Opuntia, Group 1	Cactus pear, Prickly pear	Figuier de Barbarie	Feigenkaktus	Chumbera, Nopal tunero, Tuna
Opuntia, 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 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 Beispielssorten 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: pubescence 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: undulation 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, Rubí Reyna	5
		many	important	groß	alto	Villanueva, Rojo San Juan	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten 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	waagerecht	horizontal	Cardón	5
21.		**Central spine: flexibility**	**Aiguillon central: flexibilité**	**Zentraler Stachel: Biegsamkeit**	**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 stigmate**	**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 Beispielssorten 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	aplati	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 Beispielssorten 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 Fruchtboden-ansatzes**	**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 Martín	3
43.		**Fruit: diameter of receptacle scar**	**Fruit: diamètre de la cicatrice du réceptacle**	**Frucht: Durch-messer des Frucht-bodenansatzes**	**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 Beispielssorten 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: Gleich-mäßigkeit 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, Rubí 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, Rubí 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 Beispielssorten 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 complète-ment 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 ver-kümmerter 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 Beispielssorten 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.

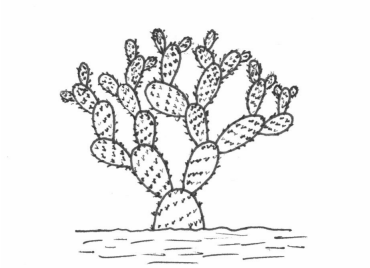
(c) Flower: Unless otherwise stated all observations on the flower should be made at the peak of flowering time. All observations on the flower should be made at the first day of opening.

(d) Fruit: All observations on the fruit should be made on 20 intact fruits which are fully mature for consumption.

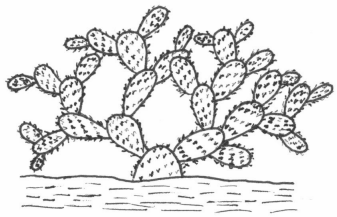
(e) Fruit diameter/thickness of peel/acidity/total soluble solids: The observations of fruit diameter, thickness of peel, acidity and total soluble solids should be made in the middle part of the fruit. For total soluble solids the middle part of the fruit must be used with the help of a refractometer.

8.2 Explanations for individual characteristics

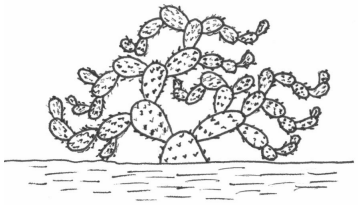
Ad. 1: Plant: growth habit



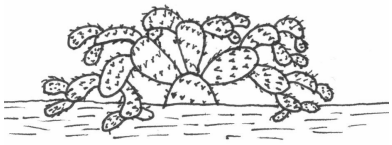
1
upright



2
spreading

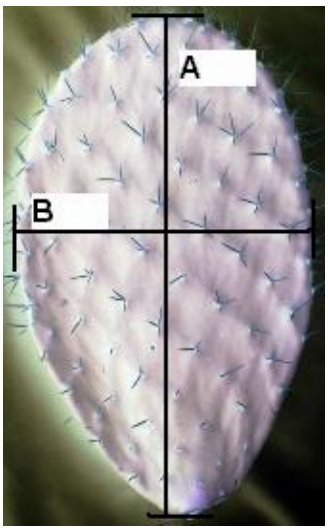


3
decumbent



4
drooping

Ad. 4: Cladode: length
Ad. 5: Cladode: width

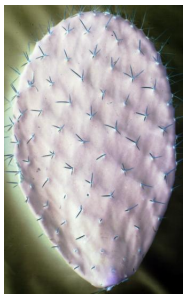


A= length
B= width

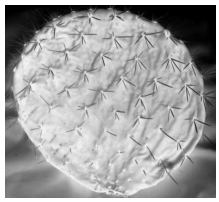
Ad. 7: Cladode: shape

1
narrow elliptic

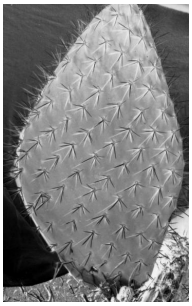
2
medium elliptic



3
broad elliptic



4
circular

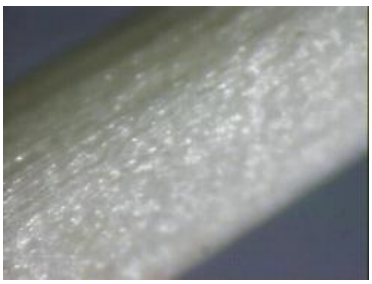


5
rhombic

6
narrow obovate

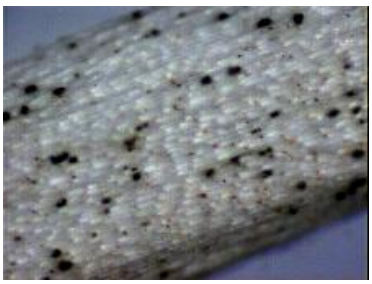
7
broad obovate

Ad. 19: Spine: surface



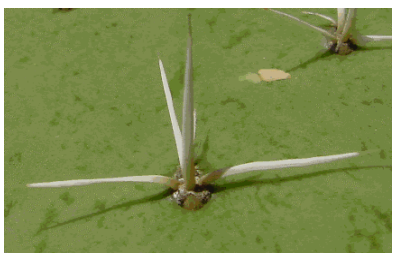
1
smooth

2
grooved



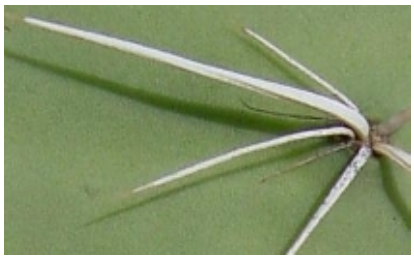
3
prickled

Ad. 20: Central spine: attitude



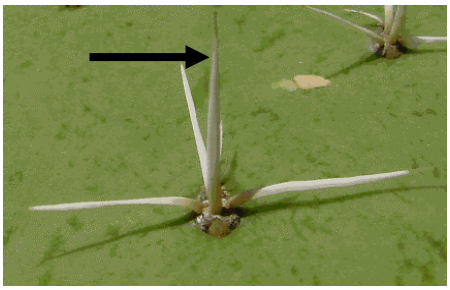
1
erect

3
semi-erect

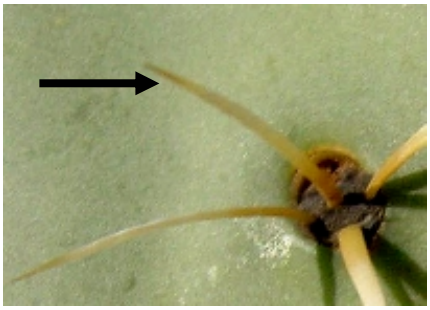


5
horizontal

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

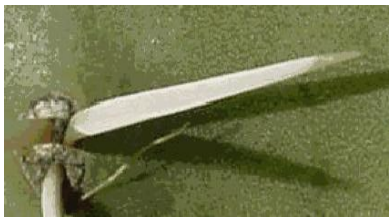


1
absent



9
present

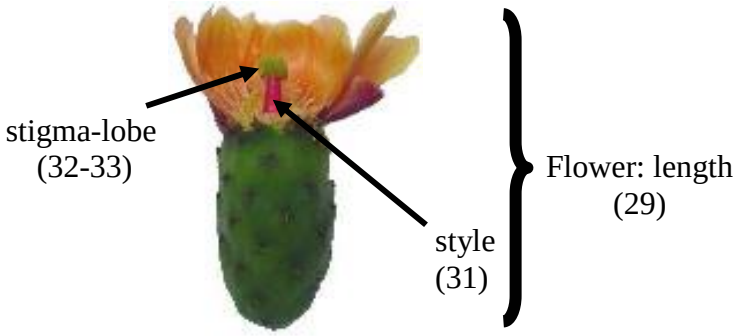
Ad. 23: Central spine: twisting



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	Amarrilla Montesa, Monteza, Amarilla Huesona, Miquihuana
Esmeralda	COPENA XXA
Fafayuca	Fafayuco, Octubreña
Torreoja	Torrioja, 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	*Botanical Name*	*Opuntia*, Group 1 Please state species:	[ ]
	Common Name	Cactus Pear	
1.2	*Latin Name*	*Opuntia*, Group 2 Please state species:	[ ]
	Common Name	Xoconostles	

2. Applicant

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

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:

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

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

	Characteristics	Example Varieties	Note
5.4 (59)	**Flowering habit**		
	once flowering	Cristalina, Reyna, Rojo Pelón	1[ ]
	twice flowering	Cuaresmeño	2[ ]
5.5 (60)	**Time of harvest maturity**		
	very early	Tapón de Mayo	1[ ]
	early	Tapón Aguanoso	3[ ]
	medium	Montesa, Pico Chulo, Reyna	5[ ]
	late	Burrona, 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
Example	*Fruit: length*	*short*	*medium*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

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

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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

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

9. Information on plant material to be examined 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]