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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

**TECHNICAL WORKING PARTY
FOR
FRUIT CROPS**

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WORKING PAPER ON DRAFT TEST GUIDELINES FOR CACTUS PEAR
(Opuntia spp.)

Document prepared by experts from Mexico

The attached document TG/C-PEAR(proj.1) already incorporates the standard wording of document TGP/7.2, which was adopted by the Technical Committee at its thirty-eighth session in April 2002, and includes some additional standard wording from document TGP/7.1 Draft 1, also agreed at that session.

[Document TG/C-PEAR(proj.1) follows]



TG/C-PEAR(proj.1) (TWF/33/9)

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

CACTUS PEAR*

*Opuntia spp.**

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names: *

Latin	English	French	German	Spanish
<i>Opuntia spp.</i>	Cactus pear	Cactus		

ASSOCIATED DOCUMENTS

These guidelines should be read in conjunction with document TG/1/3, “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (hereinafter referred to as 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 Guidelines

These Test Guidelines apply to all varieties of *Opuntia* (Tourn.) Mill. spp. (Cactaceae).

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:

8 plants of three years old, or

if accepted by the competent authority, 10 branches that include three successive cladodes each, sufficient to propagate 8 plants.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease. It should preferably not be obtained from *in vitro* propagation. If it has been produced by *in vitro* propagation this fact has to be stated by the applicant.

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 *Duration of Tests*

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

3.2 *Testing Place*

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be seen at that place, the variety may be tested at an additional place.

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. In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

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

- a] Cladodes: Unless otherwise stated all observations on the cladodes should be made on mature ones of an age of one to two years old.
- b] Areola, spines and glochides: Unless otherwise stated all observations on the areola spines and glochides should be made on intact fruits with the help of a stereoscopic microscope.
- c] Flower: Unless otherwise stated all observations in the flower should be made at the peak of the flowering time. All observations in flower should be made on the 1st day of opening.
- d] Fruit: All observations on the fruit should be made on unclean 20 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 and the lecture must be done with the help of a refractometer.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of, at least 8 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 determined by measuring or counting should be made on 6 plants or 2 parts taken from each of 6 plants. In particular, observation on fruit characteristics 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 minimum duration of tests recommended in section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

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 The acceptable number of off-types tolerated in a sample size of 6 plants is 1 on the basis of a population standard of 1% and an acceptance probability of 95%.

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 seed or 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 cactus pears can be separated in two groups as follows:

Group 1:

Cactus pear (*Opuntia amyclaea* Tenore, *Opuntia ficus-indica* (L.) Miller., *Opuntia streptacantha* Lemaire, *Opuntia megacantha* Salm-Dick, *Opuntia duranguensis* Britton et Rose, *Opuntia lasyacantha* Pfeiffer, *Opuntia robusta* Wendland, *Opuntia hyptiacantha* Weber).

Flowering once a year, the fruit is persistence from 1 to 2 months. Fruits with medium thickness peel, occupying 1/4 to 1/2 of the total thickness of the fruit. The seeds are distributed throughout the flesh, which is sweet and less juicy than Group 2.

Group 2:

Xoconostles (*Opuntia joconostle* Weber, *O. matudae* Sheinvar, *O. oligacantha* Shienvar, *O. leucotrica* de Candolle, *O. heliabravoana* Sheinvar, *O. spinulifera* Sheinvar).

Flowering twice a year. Fruits with thick peel derived from the receptacle of wide flowers, seeds concentrated in the central part of the flesh. Juicy and acid flesh. Persistence of fruit up to 6 or 8 months.

5.2 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 is aided by the use of grouping characteristics.

5.3 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.

5.4 The following have been agreed as useful grouping characteristics:

- (a) Cladode: color of areoles (characteristic 14)
- (b) Fruit: size of fully developed seeds (characteristic 55)
- (c) Fruit: time of harvest maturity (characteristic 61)

5.5 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 Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3

(QN) Quantitative characteristic – see Section 6.3

(PQ) Pseudo-Qualitative characteristic – see Section 6.3

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

a to e See Section 3.3.1

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

MoE ^o	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	Plant: growth habit			Planta: hábito de crecimiento		
(+)						
	upright			erecto	Cardona, Roja	1
	spreading			extendido	Chapeada, Cristalina	2
	decumbent			decumbente	Pabellón, Rojo Pelón	3
	drooping			colgante	Sanjuanera	4
2.	Plant: height			Planta: altura		
	short			baja	Tapona de Mayo	3
	medium			mediana	Cristalina	5
	tall			Alta	Reyna, Rubí Reyna	7
3.	Plant: width			Planta: anchura		
	narrow			estrecha	Pabellón	3
	medium			media	Cristalina	5
	broad			ancha	Rubí Reyna	7
4.	Cladode: length			Cladodio: longitud		
(+)						
	short			corta	Pabellón, Pico Chulo	3
	medium			media	Chapeada, Cristalina	5
	Long			largo	COPENA Z-1, Montesa, Reyna	7
5.	Cladode: width			Cladodio: anchura		
(+)						
	narrow			estrecha	Rubí Reyna, Sanjuanera	3
	medium			media	COPENA T-5, Montesa	5
	broad			ancha	Naranjón Legítimo, Mango, Tapón	7

^o MoE = Method of Examination

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	a	Cladode: length/width ratio			Cladodio: relación largo/ancho		
		small			pequeña	Tapón	3
		medium			media	COPENA T-5, Reyna	5
		Large			grande	COPENA F-1	7
7.	a	Cladode: shape			Cladodio: forma		
		(+)					
		lanceolate			lanceolado	COPENA F-1, Tlaconopal	1
		oblong			oblongo	Ixtapa	2
		elliptic			elíptico	Milpa Alta	3
		circular			circular	Tapón	4
		rhombic			rómbico	Atlixco, Trompa de Cochino	5
		narrow obovate			estrecho obovado	Rubí Reyna	6
		obovate			obovado	Fafayuca	7
8.	a	Cladode: thickness			Cladodio: grosor		
		(*)					
		thin			delgado	COPENA T-2, Rubí Reyna, Sanjuanera	3
		medium			medio	Montesa	5
		thick			grueso	Pabellón, Rojo Pelón, Tapón	7
9.	a	Cladode: color			Cladodio: color		
		yellow green			verde amarillo	Cristalina, Reyna, Rojo Pelón	1
		light green			verde claro	Milpa Alta	2
		medium green			verde medio	Blanca Pepina	3
		dark green			verde oscuro	Morado Jalpa, Roja San Martín	4
		bluish green			verde azulado	Tapón de Mayo	5

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.	a	Cladode: waxiness			Cladodio: superficie cerosa		
		very weakly expressed			muy poco expresado	Tlaconopal	3
		weakly expressed			poco expresado	COPENA T-5	5
		strongly expressed			fuertemente expresado	Copo de Nieve	7
11.	a	Cladode: pubescence on the surface			Cladodio: pubescencia en la superficie		
		absent			ausente	Milpa Alta	1
		present			presente	Cuaresmeño, Valterrilla	9
12.	a	Cladode: undulation of margin			Cladodio: ondulación del margen		
		absent			ausente	Reyna	1
		present			presente	Bola de Masa, Oreja de Elefante	9
13.	a b	Cladode: number of areoles in central row			Cladodio: número de areólas en la hilera central		
		few			Pocas	Rojo Pelón, Tapón	3
		medium			Media	Fafayuca, Mango, Rubí Reyna	5
		many			Muchas	Cardona, Charola, Reyna	7
14. (*)	a b	Cladode: color of areoles			Cladodio: color de las areólas		
		grey			gris	Milpa Alta, Reyna	1
		yellow brown			amarillo marrón	Burrona	2
		brown			marrón	Chaveña	3
		black			negro	Cardona	4

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15. (*)	a b	Cladode: number of spines per areole			Cladodio: número de espinas por areóla		
		absent or very few			ausentes	Pabellón, Rojo Pelón	1
		few			pocas	Naranjón Legítimo	3
		medium			media	Chapeado, Cristalina	5
		many			abundantes	Sanjuanera	7
		very many			muy abundantes	Cuaresmeño, Duraznillo	9
16.	a b	Cladode: main color of spines			Cladodio: color principal de la espina		
		grey			gris	Cardona	1
		white			blanco	Reyna	2
		yellow			amarillo	Duraznillo, Tapón	3
		brown			marrón	Rosa de Castilla, San Pedreña	4
17.	a b	Cladode: two colors on spines			Cladodio: dos colores en la espina		
		present			presente	Cardona, Chapeado, Cristalina	1
		absent			ausente	Alfajayucan, Rosa de Castilla, Tapón	9
18.	a b	Cladode: length of the longest spine			Cladodio: longitud de la espina más larga		
		short			corta	Cristalina	3
		medium			media	Montesa, Pico Chulo	5
		long			larga	Reyna, Sanjuanera	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19.	a	Cladode: attitude of the center spine			Cladodio: postura de la espina central		
(+)	b						
		erect			erectas	Fafayuca	1
		semi-erect			semi-erecto	Tuna Morada II	2
		horizontal			horizontales	Cardona	3
20.	a	Cladode: surface of spines			Cladodio: superficie de espinas		
(+)	b						
		smooth			lisa	Amarillo	1
		longitudinal grooves			estrías longitudinales	Reyna	2
		prickled			puado	Tapón	3
21.	a	Cladode: consistency of central spine			Cladodio: consistencia de la espina central		
	b						
		flexible			flexible	Cristalina	1
		rigid			rígida	Reyna	2
		brittle			quebradiza	Burrona	3
22.	a	Cladode: curvature of central spine			Cladodio: clase de espina central		
(+)	b						
		straight			recta	Burra, Sanjuanera	1
		curved			curva	Cardón de Castilla	2
23.	a	Cladode: twisting of central spine			Cladodio: torcedura de espina central		
(+)	b						
		absent			ausente	Burra, Burrona	1
		present			presente	Rubí Reyna, Sanjuanera	9

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24.	a	Cladode: shape of central spine			Cladodio: forma de la espina central		
	b						
		acicular			aciculares	Burra, Cuaresmeño	1
		cylindrical			cilíndrica	Montesa	2
25.	a	Cladode: shape of central spine in cross section			Cladodio: forma de la espina central en la sección transversal		
	b						
		elliptic			elíptica	Amarilla	1
		circular			circular	Montesa	2
		triangular			triangular	Pachón	3
26. (*)	a	Cladode: presence of glochides			Cladodio: presencia de glóquidas		
	b						
		absent or very few			ausentes o muy pocas	Blanca San José, Rojo Pelón	1
		few			Pocas	Reyna	2
		many			abundantes	Montesa, Tuna Mantequilla	3
27.	a	Cladode: color of glochides			Cladodio: color de glóquidas		
	b						
		yellow			amarillas	Amarilla, Tapón	1
		brown			marrón	Cristalina, Reyna, Rojo Pelón	2
28.	c	Flower: number per cladode			Flor: número por cladodio		
		few			pocos	Esmeralda, Tapón de Mayo	3
		medium			medio	Cristalina	5
		many			muchos	Reyna	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29.	[c]	Flower: length			Flor: longitud		
(+)		short			Corta	Cardona, Memelo	3
		medium			media	Pico Chulo, Reyna	5
		long			Larga	Cristalina, Montesa	7
30.	[c]	Flower: color of perianth			Flor: color del perianto		
(*)		greenish yellow			amarillo verdoso	Cardona, Duraznillo	1
		yellow			amarillo	Tapón Macho	2
		brownish yellow			amarillo café	Rojo Pelón	3
		orange			anaranjado	Chapeada, Reyna	4
		red			rojo	Roja San Martín, Tuna Rosa	5
31.	[c]	Flower: color of style			Flor: color del estilo		
(*)		green			verde	Duraznillo	1
(+)		white			blanco	Montesa, Tapón	2
		yellow			amarillo	Cardona	3
		pink			rosa	Morada, Pico Chulo	4
		red			rojo	Pabellón, Rojo Pelón	5
32.	[c]	Flower: number of stigma lobes			Flor: número de lóbulos del estigma		
(+)		few			pocos	Colorada, Sanjuanera	3
		medium			media	Cristalina, Pabellón	5
		many			muchos	Memelo, Rubí Reyna	7
33.	[c]	Flower: color of stigma lobes			Flor: color de los lóbulos del estigma		
(+)		yellow			amarillos	Morada Jalpa	1
		green			verdes	Cristalina, Reyna	2

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34.	[d]	Fruit: length			Fruto: longitud		
(*)		short			corto	Tapona de Mayo	3
		medium			mediano	Reyna, Rojo Pelón	5
		long			largo	Burrona, Cristalina, Montesa	7
35.	[d]	Fruit: width			Fruto: anchura		
(*)		narrow			estrecha	Rubí Reyna	3
		medium			media	Rojo Pelón	5
		broad			ancha	Burrona, Cristalina, Tapona de Mayo	7
36.	[d]	Fruit: ratio length/diameter			Fruto: relación longitud/diámetro		
	[e]	small			pequeño	Burrona, Reyna	3
		medium			mediano	Blanca de Castilla, Rojo Pelón	5
		large			grande	Montesa, Rubí Reyna	7
37.	[d]	Fruit: shape			Fruto: forma		
(+)		oblong			oblongo	Copena 17, Torreoja	1
		narrow ellipsoid			elipsoide angosto	Rubí Reyna	2
		ellipsoid			elipsoide	Reyna	3
		spheroid			esferoide	Cardona	4
		obloid			obloide	Tapón de Mayo	5
		obovoid			obovoide	Roja Jalpa	6
38.	[b]	Fruit: density of areoles			Fruto: densidad de areólas		
	[d]	sparse			poca	Tapón de Mayo	3
		medium			media	Cristalina	5

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
	dense			densa	Rubí Reyna	7
39.	b	Fruit: number of glochides		Fruto: número de glóquidas		
(*)	d	few		pocas	Tapón de Mayo	3
		medium		media	Cristalina	5
		many		muchas	Montesa, Reyna, Rubí Reyna	7
40.	b	Fruit: color of glochides		Fruto: color de glóquidas		
(*)	b	yellow		amarillo	Blanca San José, Camuso, Tuna Mansa	1
		brown		marrón	Amarrilla, Pico Chulo, San Nicolás	2
41.	d	Fruit: length of stalk		Fruto: longitud del pedúnculo		
(+)		short		corto	COPENA T-5, Reyna	3
		medium		medio	Montesa	5
		long		largo	Cristalina, Sanjuanera	7
42.	d	Fruit: depression of receptacle scar		Fruto: depresión de la cicatriz del receptáculo		
(+)		absent or very slightly depressed		ausente o muy ligera depresión	Reyna, Rojo Pelón	3
		slightly depressed		ligera depresión	Amarilla, Pico Chulo	5
		strongly depressed		fuerte depresión	Rubí Reyna	7
43.	d	Fruit: diameter of receptacle scar		Fruto: diámetro de la cicatriz del receptáculo		
		small		pequeña	Montesa, Rubí Reyna	3
		medium		media	Cristalina, Pico Chulo	5
		large		grande	Tapón de Mayo	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44.	d e	Fruit: thickness of peel			Fruto: grosor de cáscara		
		thin			delgada	Montesa, Reyna	3
		medium			mediana	Cristalina, Rojo Pelón	5
		thick			gruesa	Burrona, Fafayuca, Mango	7
45.	d	Fruit: weight of peel			Fruto: peso de cáscara		
		light			ligero	Reyna	3
		medium			mediano	Cristalina, Montesa	5
		heavy			pesado	Burrona, Chapeada	7
46.	d	Fruit: weight of flesh			Fruto: peso de la pulpa		
		very light			muy ligero	Duraznillo	1
		light			ligero	Charola	3
		medium			mediano	Chapeado, Pico Chulo	5
		heavy			pesado	Amarillo Montesa, Naranjón Legítimo	7
		very heavy			muy pesado	Burrona, Cristalina	9
47.	d	Fruit: weight ratio of flesh/peel			Fruto: relación peso de pulpa/cáscara		
		small			pequeño	Cascarón	3
		medium			mediano	Chapeada, Fafayuca	5
		large			grande	Cristalina, Reyna	7
48.	d	Fruit: evenness of color surfaces			Fruto: uniformidad del color de la superficie		
		even			parejo	Burrona, Cristalina	1
		uneven			disparejo	Chapeado	9

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49.	d	Fruit: main color of peel			Fruto: color principal de la cáscara		
(*)		white			blanca	Blanca Platanillo	1
		light green			verde claro	Gavia	2
		medium green			verde medio	Esmeralda	3
		dark green			verde obscuro	Burrona, Reyna	4
		yellow			amarilla	Amarilla Plátano	5
		orange			naranja	Montesa, Naranjón, Pico Chulo	6
		pink			rosa	Memelo	7
		medium red			rojo medio	Cardona, Rojo Pelón, Rubí Reyna	8
		dark red			rojo obscuro	Cardona	9
		purple			púrpura	Morada Jalpa, Roja San Martín, Tapón	10
50.	d	Fruit: color of flesh			Fruto: color de pulpa		
(*)		light green			verde claro	Cristalina, Esmeralda, Reyna	1
		medium green			verde medio	Burrona	2
		yellow			amarillo	Montesa	3
		orange			naranja	Pico Chulo	4
		pink			rosa	Meloncillo Rosa, Memelo	5
		red			rojo	Rojo Pelón, Rubí Reyna	6
		purple			púrpura	Liria, Morada Jalpa, Roja San Martín	7
51.	d	Fruit: firmness of flesh			Fruto: firmeza de pulpa		
		soft			suave	Memelo	3
		medium			media	Cristalina	5
		firm			firme	Fafayuca	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.	d	Fruit: juiciness of flesh			Fruto: jugosidad de la pulpa		
		low			baja	Amarilla Plátano, Memelo	3
		medium			media	Reyna	5
		high			alta	Burrona, Cristalina, Fafayuca	7
53. (*)	d	Fruit: number of fully developed seeds			Fruto: número de semillas completamente desarrolladas		
		few			pocas	Cardón, Charola, Montesa	3
		medium			media	COPENA T-5, Cristalina, Reyna	5
		many			muchas	Burrona	7
54.	d	Fruit: weight of fully developed seeds (100 seeds)			Fruto: peso de semillas completamente desarrolladas (100 semillas)		
		light			ligero	Cardona, Cáscarona	3
		medium			medio	Reyna	5
		heavy			pesado	Burrona	7
55. (*)	d	Fruit: size of fully developed seeds			Fruto: tamaño de semillas completamente desarrolladas		
		small			pequeña	Cardona, Cascarona, Curesmeño	3
		medium			media	Pico Chulo, Reyna	5
		large			grande	Blanca San José, Burrona, Chapeada	7

	MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
56.	d	Fruit: presence of abortive seeds			Fruto: presencia de semillas abortivas		
(*)		few			pocas	Burrona, Cardona, Tapón	3
		medium			media	Chapeada, Cristalina, Pico Chulo	5
		many			muchas	Charola, Reyna	7
57.	d	Fruit: acidity			Fruto: acidez		
	e						
		low			baja	Blanca Larga	3
		medium			media	Fafayuca	5
		high			alta	Blanca de Castilla	7
58.	d	Fruit: total soluble solids (sweetness)			Fruto: sólidos totales solubles (dulzor)		
	e						
		low			bajo	Burrona, Tapón	3
		medium			medio	Cristalina, Pico Chulo, Rojo Pelón	5
		high			alto	Fafayuca, Reyna	7
59.		Time of beginning of flowering			Tiempo en el comienzo de la floración		
(*)		early			temprano	Sanjuanera, Tapón	3
		medium			medio	Pico Chulo, Reyna, Rojo Pelón	5
		late			tardío	Burrona, Charola, Cristalina	7
60.		Flowering habit			Hábito de floración		
(*)		once flowering			una floración	Cristalina, Reyna, Rojo Pelón	1
		twice flowering			doble floración	Cuaresmeño	2

MoE	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
61. (*)	Time of harvest maturity			Tiempo de madurez de cosecha		
	very early			muy temprana	Tapón de Mayo	1
	early			temprana	Tapón	3
	medium			media	Pico Chulo, Montesa, Reyna	5
	late			tardía	Burrona, Esmeralda, Fafayuca	7
	very late			muy tardía	Charola, Chaveña	9
62.	Duration of harvesting period of fruit			Duración del período de cosecha de fruta		
	short			corto	Chapeada, Torreoja	3
	medium			medio	Pico Chulo, Reyna	5
	long			largo	Burrona	7
63.	Shelf life performance of fruit			Comportamiento en vida de anaquel del fruto		
	short			corta	Chapeada, Roja San Martín	3
	medium			media	Pico Chulo, Reyna, Rojo Pelón	5
	long			larga	Burrona, Cristalina, Esmeralda	7
64.	Vegetative period until flowering			Periodo vegetativo hasta su floración		
	short			corta	Cristalina	3
	medium			media	Reyna	5
	long			larga	Rojo Pelón	7

8. Explanations on the Table of Characteristics

Ad. 1: Plant: growth habit



1
upright



2
spreading



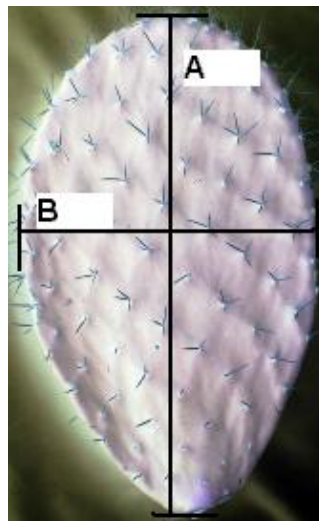
3
decumbent



4
drooping

Ad. 4: Cladode: length

Ad. 5: Cladode: width



A= length
B= width

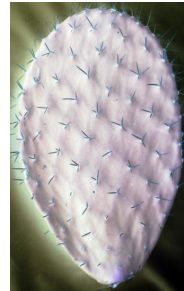
Ad. 7: Cladode: shape



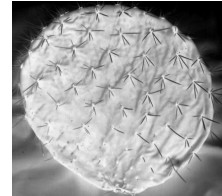
1
lanceolate



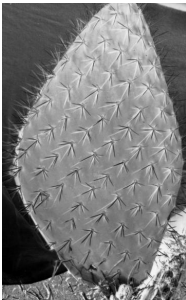
2
oblong



3
elliptic



4
circular



5
rhombic



6
narrow obovate



7
obovate

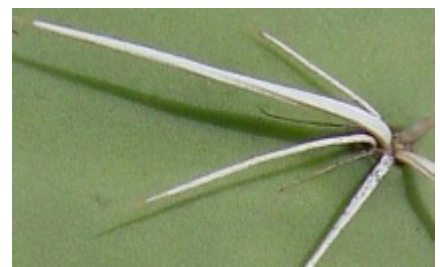
Ad. 19: Cladode: attitude of the central spine



1
erect

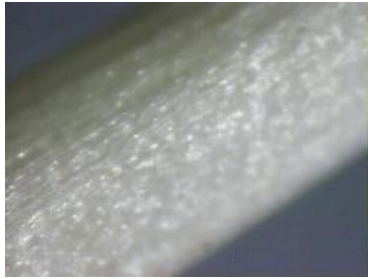


2
semi-erect



3
horizontal

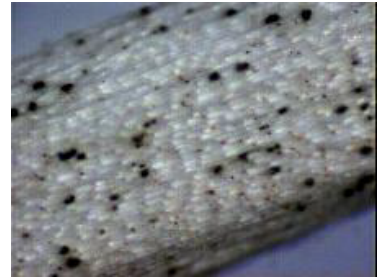
Ad. 20: Cladode: surface of spines



1
smooth



2
longitudinal grooves



3
prickled

Ad. 22: Cladode: curvature of central spine



1
absent



2
present

Ad. 23: Cladode: twisting of central spine

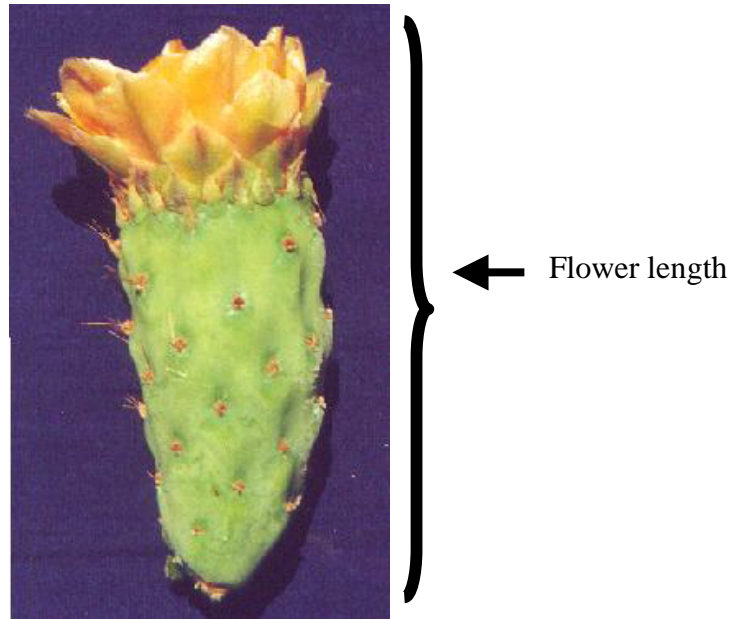


1
absent



9
present

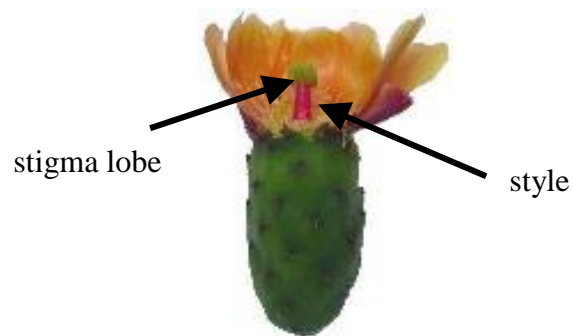
Ad. 29: Flower: length



Ad. 31: Flower: color of style

Ad. 32: Flower: number of stigma lobe

Ad. 33: Flower: color of stigma lobe



Ad. 37: Fruit: shape



1
oblong



2
narrow ellipsoid



3
ellipsoid



4
spheroid



5
obloid



6
obovoid

Ad. 41: Fruit: length of stalk



3
short



5
medium



7
long

Ad. 42: Fruit: depression of receptacle scar



3
absent or very slightly depressed

5
slightly depressed



7
strongly depressed

Synonyms of the 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
Tapón de Mayo	Mayera
Torroja	Torroja, Frida, Frieda, COPENA XXXA
Milpa Alta	Tuna Morada
Pico Chulo	Naranjona, Apastillada, Copo de Oro
Amarilla Plátano	Milpa Alta Amarilla
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 Latin Name	<input type="text" value="Opuntia spp."/>	
1.2 Common Name	<input type="text" value="CACTUS PEAR"/>	
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 Variety resulting from:

- (a) controlled cross []
 (please state parent varieties)
- (b) partially unknown cross []
 (please state known parent variety(ies))
- (c) totally unknown cross []

4.1.2 Mutation [] (please state parent variety)

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

4.1.4 Other [] (please provide details)

4.2 Method of Propagating the Variety

4.2.1 *In vitro* propagation

The plant material of the candidate variety has been obtained
 by *in vitro* propagation yes []
no []

4.3 Virus status []

4.3.1 The variety is free from all known viruses as follows: (indicate from which viruses)

.....

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

.....

4.3.3 The virus status is unknown []

[]

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

Characteristics	Example Varieties	Note
5.1 Cladode: thickness (8)		
thin	COPENA T-2, Rubí Reyna, Sanjuanera	3[]
medium	Montesa	5[]
thick	Pabellón, Rojo Pelón, Tapón	7[]
5.2 Cladode: color of areoles (14)		
grey	Milpa Alta, Reyna	1[]
yellow brown	Burrona	2[]
brown	Chaveña	4[]
black	Cardona	5[]
5.3 Cladode: number of spines per areole (15)		
absent or very few	Pabellón, Rojo Pelón	1[]
few	Naranjón Legítimo	3[]
medium	Chapeado, Cristalina	5[]
many	Sanjuanera	7[]
very many	Cuaresmeño, Duraznillo	9[]
5.4 Cladode: presence of glochides (26)		
absent or very few	Blanca San José, Rojo Pelón	3[]
few	Reyna	5[]
many	Montesa, Tuna Mantequilla	7[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
5.5 Cladode: color of perianth (30)		
greenish yellow	Cardona, Duraznillo	1[]
yellow	Tapón Macho	2[]
brownish yellow	Rojo Pelón	3[]
orange	Chapeada, Reyna	4[]
red	Roja San Martín, Tuna Rosa	5[]
5.6 Flower: color of style (31)		
green	Duraznillo	1[]
white	Montesa, Tapón	2[]
yellow	Cardona	3[]
pink	Morada, Pico Chulo	4[]
red	Pabellón, Rojo Pelón	5[]
5.7 Fruit: length (34)		
short	Tapón de Mayo	3[]
medium	Reyna, Rojo Pelón	5[]
long	Burrona, Cristalina, Montesa	7[]
5.8 Fruit: width (35)		
narrow	Ruby Reyna	3[]
medium	Rojo Pelón	5[]
broad	Burrona, Cristalina, Tapona de Mayo	7[]
5.9 Fruit: number of glochides (39)		
few	Tapón de Mayo	1[]
medium	Cristalina	2[]
many	Montesa, Reyna, Rubí Reyna	3[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
5.10 Fruit: color of glochides (40)		
yellow	Blanca San José, Camueso, Tuna Mansa	1[]
brown	Amarilla San Nicolás, Pico Chulo	2[]
5.11 Fruit: main color of peel (49)		
white	Blanca Platanillo	1[]
light green	Gavia	2[]
medium green	Esmeralda	3[]
dark green	Burróna, Reyna	4[]
yellow	Amarilla Plátano	5[]
orange	Montesa, Naranjón, Pico Chulo	6[]
pink	Memelo	7[]
medium red	Cardona, Rojo Pelón, Rubí Reyna	8[]
dark red	Cardona	9[]
purple	Morada Jalpa, Roja San Martín, Tapón	10[]
5.12 Fruit: color of flesh (50)		
light green	Cristalina, Esmeralda, Reyna	1[]
medium green	Burróna	2[]
yellow	Montesa	3[]
orange	Picho Chulo	4[]
pink	Meloncillo Rosa, Memelo	5[]
red	Rojo Pelón, Rubí Reyna	6[]
purple	Liria, Morada Jalpa, Roja San Martín	7[]
5.13 Fruit: number of fully developed seeds (53)		
few	Cardón, Charola, Montesa	3[]
medium	COPENA T-5, Cristalina, Reyna	5[]
many	Blanca San José, Burróna, Chapeada	7[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
5.14 Fruit: size of fully developed seeds		
(55)		
small	Cardona, Cascarona, Curesmeño	3[]
medium	Pico Chulo, Reyna	5[]
large	Charola, Reyna	7[]
5.15 Fruit: presence of abortive seeds		
(56)		
few	Burrona, Cardona, Tapón	3[]
medium	Chapeada, Cristalina, Pico Chulo	5[]
many	Charola, Reyna	7[]
5.16 Time of beginning of flowering		
(59)		
early	Sanjuanera, Tapón	3[]
medium	Pelón Rojo, Pico Chulo, Reyna	5[]
late	Burrona, Charola, Cristalina	7[]
5.17 Flowering habit		
(60)		
once flowering	Cristalina, Reyna, Rojo Pelón	1[]
twice flowering	Cuaresmeño	2[]
5.18 Time of harvest maturity		
(61)		
very early	Tapón de Mayo	1[]
early	Tapón	3[]
medium	Montesa, Pico Chulo, Reyna	5[]
late	Burrona, Esmeralda, Fafayuca	7[]
very late	Charola, Chaveña	9[]

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 Special conditions for the examination of the variety

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

Yes [] No []

7.2.2 If yes, please give details:

7.3 Other information

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.

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

Applicant's name

Signature

Date