



These Test Guidelines have been superseded by a later version. The latest adopted version of Test Guidelines can be found at [http://www.upov.int/test\\_guidelines/en/list.jsp](http://www.upov.int/test_guidelines/en/list.jsp)

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Ces principes directeurs d'examen ont été remplacés par une version ultérieure. La version adoptée la plus récente des principes directeurs d'examen figure à l'adresse suivante : [http://www.upov.int/test\\_guidelines/fr/list.jsp](http://www.upov.int/test_guidelines/fr/list.jsp)

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Diese Prüfungsrichtlinien wurden durch eine neuere Fassung ersetzt. Die neueste angenommene Fassung von Prüfungsrichtlinien ist unter [http://www.upov.int/test\\_guidelines/en/list.jsp](http://www.upov.int/test_guidelines/en/list.jsp) zu finden.

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Las presentes directrices de examen han sido reemplazadas por una versión posterior. La versión de las directrices de examen de más reciente aprobación está disponible en [http://www.upov.int/test\\_guidelines/es/list.jsp](http://www.upov.int/test_guidelines/es/list.jsp).

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TG/217/1

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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**

GENEVA

**CACTUS PEAR**  
and  
**XOCONOSTLES**  
*(Opuntia, Groups 1 & 2)*

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

Alternative Names: \*

| <i>Latin</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                  |

**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](http://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. It should preferably not be obtained from *in vitro* propagation.

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 observed at that place, the variety may be tested at an additional place.

### 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 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 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 is 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.

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
  
- (a)–(e) See Explanations on the Table of Characteristics in Section 8.1
- (+) See Explanations on the Table of Characteristics in Section 8.2



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

|               | English                    | français                 | deutsch                   | español                   | Example Varieties<br>Exemples<br>Beispielsorten<br>Variedades ejemplo | Note/<br>Nota |
|---------------|----------------------------|--------------------------|---------------------------|---------------------------|---|---------------|
| <b>1.</b>     | <b>Plant: growth habit</b> | <b>Plante: port</b>      | <b>Pflanze: Wuchsform</b> | <b>Planta: porte</b>      |   |               |
| (+)           |                            |                          |                           |                           |   |               |
| <b>PQ</b>     | 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             |
| <b>2.</b>     | <b>Plant: height</b>       | <b>Plante: hauteur</b>   | <b>Pflanze: Höhe</b>      | <b>Planta: altura</b>     |   |               |
| <b>QN</b>     | short                      | basse                    | niedrig                   | baja                      | Pico Chulo, Torreoja  | 3             |
|               | medium                     | moyenne                  | mittel                    | media                     | Esmeralda, Rojo Vigor   | 5             |
|               | tall                       | haute                    | hoch                      | alta                      | Oreja de Elefante   | 7             |
| <b>3.</b>     | <b>Plant: width</b>        | <b>Plante: largeur</b>   | <b>Pflanze: Breite</b>    | <b>Planta: anchura</b>    |   |               |
| <b>QN</b>     | narrow                     | étroite                  | schmal                    | estrecha                  | Copena F-1, Rojo Lirio  | 3             |
|               | medium                     | moyenne                  | mittel                    | media                     | Cristalina, Esmeralda   | 5             |
|               | broad                      | large                    | breit                     | ancha                     | Montesa, Reyna  | 7             |
| <b>4.</b>     | <b>Cladode: length</b>     | <b>Cladode: longueur</b> | <b>Kladodium: Länge</b>   | <b>Cladodio: longitud</b> |   |               |
| (+)           |                            |                          |                           |                           |   |               |
| <b>QN (a)</b> | short                      | courte                   | kurz                      | corta                     | Pico Chulo, Sanjuanera,<br>Tapón de Mayo                              | 3             |
|               | medium                     | moyenne                  | mittel                    | media                     | Rojo Pelón, Tapón<br>Aguanoso   | 5             |
|               | long                       | longue                   | lang                      | larga                     | Cristalina, Sangre de<br>Toro   | 7             |

|           | English                                | français                                     | deutsch   | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|-----------|--|--|---|--|--|---------------|
| <b>5.</b> | <b>Cladode: width</b>                  | <b>Cladode: largeur</b>                      | <b>Kladodium: Breite</b>                          | <b>Cladodio: anchura</b>                       |  |               |
| (+)       |  |  |   |  |  |               |
| <b>QN</b> | <b>(a)</b> 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             |
| <b>6.</b> | <b>Cladode:<br/>length/width ratio</b> | <b>Cladode: rapport<br/>longueur/largeur</b> | <b>Kladodium:<br/>Verhältnis<br/>Länge/Breite</b> | <b>Cladodio: relación<br/>longitud/anchura</b> |  |               |
| <b>QN</b> | <b>(a)</b> 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             |
| <b>7.</b> | <b>Cladode: shape</b>                  | <b>Cladode: forme</b>                        | <b>Kladodium: Form</b>                            | <b>Cladodio: forma</b>                         |  |               |
| (*)       |  |  |   |  |  |               |
| (+)       |  |  |   |  |  |               |
| <b>PQ</b> | <b>(a)</b> narrow elliptic             | elliptique étroit                            | schmal elliptisch                                 | elíptico estrecho                              | Copena F-1, Tlaconopal   | 1             |
|           | medium elliptic                        | elliptique moyen                             | 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<br>eiförmig                       | oboval estrecho                                | Rubí Reyna   | 6             |
|           | broad obovate                          | obovale large                                | breit verkehrt<br>eiförmig                        | oboval ancho                                   | Fafayuca   | 7             |

|                  | English                                     | français                                   | deutsch  | español   | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|------------------|---|--|--|---|--|---------------|
| <b>8.</b><br>(*) | <b>Cladode: thickness</b>                   | <b>Cladode: épaisseur</b>                  | <b>Kladodium: Dicke</b>                            | <b>Cladodio: grosor</b>                               |  |               |
| <b>QN</b> (a)    | thin  | fine                                       | dünn   | delgado   | Burrona, Copena T-2,<br>Montesa  | 3             |
|                  | medium                                      | moyenne                                    | mittel   | medio   | Memelo   | 5             |
|                  | thick                                       | épaisse                                    | dick   | grueso  | Pico Chulo, Rubí Reyna   | 7             |
| <b>9.</b>        | <b>Cladode: color</b>                       | <b>Cladode: couleur</b>                    | <b>Kladodium: Farbe</b>                            | <b>Cladodio: color</b>                                |  |               |
| <b>PQ</b> (a)    | yellow green                                | vert jaunâtre                              | gelbgrün   | verde amarillento                                     | Cristalina, Reyna,<br>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,<br>Roja San Martín                                       | 4             |
|                  | bluish green                                | vert bleuâtre                              | bläulichgrün                                       | verde azulado   | Tapón de Mayo  | 5             |
| <b>10.</b>       | <b>Cladode: waxiness</b>                    | <b>Cladode: pruine</b>                     | <b>Kladodium:<br/>Wachsschicht</b>                 | <b>Cladodio: cerosidad</b>                            |  |               |
| <b>QN</b> (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             |
| <b>11.</b>       | <b>Cladode: pubes-<br/>cence of surface</b> | <b>Cladode: pilosité de<br/>la surface</b> | <b>Kladodium:<br/>Behaarung der<br/>Oberfläche</b> | <b>Cladodio:<br/>pubescencia de la<br/>superficie</b> |  |               |
| <b>QL</b> (a)    | absent                                      | absente                                    | fehlend  | ausente   | Milpa Alta   | 1             |
|                  | present                                     | présente                                   | vorhanden  | presente  | Cuaresmeño, Valterrilla  | 9             |

|                   | English  | français   | deutsch   | español   | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|-------------------|--|--|---|---|--|---------------|
| <b>12.</b>        | <b>Cladode: undulation of margin</b>             | <b>Cladode: ondulation du bord</b>                       | <b>Kladodium: Randwellung</b>                           | <b>Cladodio: ondulación del margen</b>                  |  |               |
| <b>QL</b>         | (a) absent                                       | absente  | fehlend   | ausente   | Reyna  | 1             |
|                   | present  | présente   | vorhanden   | presente  | Bola de Masa,<br>Oreja de Elefante                                     | 9             |
| <b>13.</b>        | <b>Cladode: number of areoles in central row</b> | <b>Cladode: nombre d'aréoles dans la rangée centrale</b> | <b>Kladodium: Anzahl Areolen in der mittleren Reihe</b> | <b>Cladodio: número de aréolas en la hilera central</b> |  |               |
| <b>QN</b>         | (a) few  | faible   | gering  | bajo  | Cristalina, Pico Chulo,<br>Tapón de Mayo                               | 3             |
|                   | (b) medium                                       | moyen  | mittel  | medio   | Amarillo Plátano,<br>Copena T-2, Rubí Reyna                            | 5             |
|                   | many   | important  | groß  | alto  | Villanueva, Rojo San<br>Juan   | 7             |
| <b>14.</b><br>(*) | <b>Cladode: color of areoles</b>                 | <b>Cladode: couleur des aréoles</b>                      | <b>Kladodium: Farbe der Areolen</b>                     | <b>Cladodio: color de las aréolas</b>                   |  |               |
| <b>PQ</b>         | (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             |

|            | English                                     | français   | deutsch                                       | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|------------|---|--|---|--|--|---------------|
| <b>15.</b> | <b>Cladode: number of spines per areole</b> | <b>Cladode: nombre d'épines par aréole</b>         | <b>Kladodium: Anzahl Stacheln pro Areole</b>  | <b>Cladodio: número de espinas por aréola</b>    |  |               |
| <b>QN</b>  | <b>(a)</b> none or very few                 | aucune ou très rares                               | keine oder sehr wenige                        | ninguna o muy bajo                               | Pabellón, Rojo Pelón, Rojo Vigor                                       | 1             |
|            | <b>(b)</b> few                              | rare   | wenige  | bajo   | Rojo Lirio, Rojo San Martín  | 3             |
|            | medium                                      | moyennes   | mittel  | medio  | Cristalina, Esmeralda, Torreaja  | 5             |
|            | many  | nombreuses   | viele   | alto   | Sanjuanera, Villanueva   | 7             |
|            | very many                                   | très nombreuses                                    | sehr viele                                    | muy alto   | Reyna  | 9             |
| <b>16.</b> | <b>Cladode: length of longest spine</b>     | <b>Cladode: longueur de l'épine la plus longue</b> | <b>Kladodium: Länge des längsten Stachels</b> | <b>Cladodio: longitud de la espina más larga</b> |  |               |
| <b>QN</b>  | <b>(a)</b> short                            | courte   | kurz  | corta  | Memelo, Pico Chulo   | 3             |
|            | <b>(b)</b> medium                           | moyenne  | mittel  | media  | Fafayuca, Rubí Reyna   | 5             |
|            | long  | longue   | lang  | larga  | Tapón Aguanoso   | 7             |
| <b>17.</b> | <b>Spine: main color</b>                    | <b>Épine: couleur principale</b>                   | <b>Stachel: Hauptfarbe</b>                    | <b>Espina: color principal</b>                   |  |               |
| <b>PQ</b>  | <b>(a)</b> grey                             | grise  | grau  | gris   | Cardona  | 1             |
|            | <b>(b)</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             |
| <b>18.</b> | <b>Spine: number of colors</b>              | <b>Épine: nombre de couleurs</b>                   | <b>Stachel: Anzahl Farben</b>                 | <b>Espina: número de colores</b>                 |  |               |
| <b>QL</b>  | <b>(a)</b> one                              | une  | eine  | uno  | Reyna, Rosa de Castilla, Tapón Aguanoso                                | 1             |
|            | <b>(b)</b> two                              | deux   | zwei  | dos  | Cardona, Chapeado, Cristalina  | 2             |

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

|                    | English  | français  | deutsch  | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|--------------------|--|---|--|--|--|---------------|
| <b>24.</b>         | <b>Central spine:<br/>shape in dorsal<br/>view</b>   | <b>Aiguillon central:<br/>forme en vue dorsale</b>          | <b>Zentraler Stachel:<br/>Form in der<br/>dorsalen Ansicht</b> | <b>Espina central:<br/>forma en vista<br/>dorsal</b>           |  |               |
| <b>QL</b>          | (a) aciculate  | en forme d'aiguille   | nadelförmig  | aciculada  | Burra, Cuaresmeño  | 1             |
|                    | (b) narrow triangular                                | triangulaire étroite  | schmal dreieckig   | triangular estrecha  | Montesa  | 2             |
| <b>25.</b>         | <b>Central spine:<br/>shape in cross<br/>section</b> | <b>Aiguillon central:<br/>forme en vue<br/>transversale</b> | <b>Zentraler Stachel:<br/>Form im<br/>Querschnitt</b>          | <b>Espina central:<br/>forma en la sección<br/>transversal</b> |  |               |
| <b>PQ</b>          | (a) elliptic   | elliptique  | elliptisch   | elíptica   | Amarilla   | 1             |
|                    | (b) circular   | circulaire  | rund   | circular   | Montesa  | 2             |
|                    | triangular   | triangulaire  | dreieckig  | triangular   | Pachón   | 3             |
| <b>26.<br/>(*)</b> | <b>Cladode: number<br/>of glochides</b>              | <b>Cladode: nombre de<br/>glochides</b>                     | <b>Kladodium: Anzahl<br/>von Widerhäkchen</b>                  | <b>Cladodio: número<br/>de gloquidas</b>                       |  |               |
| <b>QN</b>          | (a) none or very few                                 | aucune ou très rares  | keine oder sehr<br>wenige                                      | ninguna o muy pocas  | Rojo Pelón   | 1             |
|                    | (b) few  | rares   | wenige   | pocas  | Reyna  | 2             |
|                    | many   | nombreuses  | viele  | abundantes   | Montesa,<br>Tuna Mantequilla   | 3             |
| <b>27.</b>         | <b>Cladode: color of<br/>glochides</b>               | <b>Cladode: couleur<br/>des glochides</b>                   | <b>Kladodium: Farbe<br/>der Widerhäkchen</b>                   | <b>Cladodio: color de<br/>las gloquidas</b>                    |  |               |
| <b>PQ</b>          | (a) yellow   | jaunes  | gelb   | amarillo   | Tapón Aguanoso   | 1             |
|                    | (b) brown  | marron  | braun  | marrón   | Cristalina, Reyna,<br>Rojo Pelón                                       | 2             |
| <b>28.</b>         | <b>Cladode: number<br/>of flowers</b>                | <b>Cladode: nombre de<br/>fleurs</b>                        | <b>Kladodium: Anzahl<br/>Blüten</b>                            | <b>Cladodio: número<br/>de flores</b>                          |  |               |
| <b>QN</b>          | (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<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|------------|---------------------------------------|---|-------------------------------------|--|--|---------------|
| <b>29.</b> | <b>Flower: length</b>                 | <b>Fleur: longueur</b>                    | <b>Blüte: Länge</b>                 | <b>Flor: longitud</b>                      |  |               |
| (+)        |                                       |   |                                     |  |  |               |
| <b>QN</b>  | (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             |
| <b>30.</b> | <b>Flower: color of perianth</b>      | <b>Fleur: couleur du périanthe</b>        | <b>Blüte: Farbe der Blütenhülle</b> | <b>Flor: color del perianto</b>            |  |               |
| (*)        |                                       |   |                                     |  |  |               |
| <b>PQ</b>  | (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,<br>Tuna Rosa  | 5             |
| <b>31.</b> | <b>Flower: color of style</b>         | <b>Fleur: couleur du style</b>            | <b>Blüte: Farbe des Griffels</b>    | <b>Flor: color del estilo</b>              |  |               |
| (*)        |                                       |   |                                     |  |  |               |
| (+)        |                                       |   |                                     |  |  |               |
| <b>PQ</b>  | (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             |
| <b>32.</b> | <b>Flower: number of stigma lobes</b> | <b>Fleur: nombre de lobes du stigmate</b> | <b>Blüte: Anzahl Narbenlappen</b>   | <b>Flor: número de lóbulos del estigma</b> |  |               |
| (+)        |                                       |   |                                     |  |  |               |
| <b>QN</b>  | (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<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|------------|---|---|---|---|--|---------------|
| <b>33.</b> | <b>Flower: color of stigma lobe</b>         | <b>Fleur: couleur du lobe du stigmate</b>       | <b>Blüte: Farbe des Narbenlappens</b>                 | <b>Flor: color del lóbulo del estigma</b>       |  |               |
| (+)        |   |   |   |   |  |               |
| <b>QL</b>  | (c) yellow                                  | jaune   | gelb  | amarillo  | Morada Jalpa   | 1             |
|            | green                                       | vert  | grün  | verde   | Cristalina, Reyna  | 2             |
| <b>34.</b> | <b>Fruit: length</b>                        | <b>Fruit: longueur</b>                          | <b>Frucht: Länge</b>                                  | <b>Fruto: longitud</b>                          |  |               |
| (*)        |   |   |   |   |  |               |
| <b>QN</b>  | (d) short                                   | courte  | kurz  | corta   | Amarilla Santa Inés,<br>Sangre de Toro                                 | 3             |
|            | medium                                      | moyenne   | mittel  | media   | Fafayuca, Reyna  | 5             |
|            | long  | longue  | lang  | larga   | Burrona, Cristalina  | 7             |
| <b>35.</b> | <b>Fruit: maximum diameter</b>              | <b>Fruit: diamètre maximum</b>                  | <b>Frucht: maximaler Durchmesser</b>                  | <b>Fruto: diámetro máximo</b>                   |  |               |
| (*)        |   |   |   |   |  |               |
| <b>QN</b>  | (d) narrow                                  | étroit  | schmal  | estrecho  | Cambray, Memelo  | 3             |
|            | medium                                      | moyen   | mittel  | medio   | Reyna, Solferino   | 5             |
|            | broad                                       | large   | breit   | ancho   | Burrona, Cristalina,<br>Tapón de Mayo                                  | 7             |
| <b>36.</b> | <b>Fruit: ratio length/maximum diameter</b> | <b>Fruit: rapport longueur/diamètre maximum</b> | <b>Frucht: Verhältnis Länge/maximaler Durchmesser</b> | <b>Fruto: relación longitud/diámetro máximo</b> |  |               |
| (*)        |   |   |   |   |  |               |
| <b>QN</b>  | (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,<br>Montesa   | 7             |

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

|            | English                                     | français   | deutsch  | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|------------|---|--|--|--|--|---------------|
| <b>41.</b> | <b>Fruit: length of stalk</b>               | <b>Fruit: longueur du pédoncule</b>                    | <b>Frucht: Länge des Stiels</b>                    | <b>Fruto: longitud del pedúnculo</b>                   |  |               |
| (+)        |   |  |  |  |  |               |
| <b>QN</b>  | <b>(d)</b> short                            | court  | kurz   | corta  | Amarillo Plátano, Solferino  | 3             |
|            | medium                                      | moyen  | mittel   | media  | Montesa, Pico Chulo  | 5             |
|            | long  | long   | lang   | larga  | Cristalina   | 7             |
| <b>42.</b> | <b>Fruit: depression of receptacle scar</b> | <b>Fruit: dépression de la cicatrice du réceptacle</b> | <b>Frucht: Einsenkung des Fruchtbodenansatzes</b>  | <b>Fruto: depresión de la cicatriz del receptáculo</b> |  |               |
| (+)        |   |  |  |  |  |               |
| <b>QN</b>  | <b>(d)</b> 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             |
| <b>43.</b> | <b>Fruit: diameter of receptacle scar</b>   | <b>Fruit: diamètre de la cicatrice du réceptacle</b>   | <b>Frucht: Durchmesser des Fruchtbodenansatzes</b> | <b>Fruto: diámetro de la cicatriz del receptáculo</b>  |  |               |
| <b>QN</b>  | <b>(d)</b> 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             |
| <b>44.</b> | <b>Fruit: thickness of peel</b>             | <b>Fruit: épaisseur de la peau</b>                     | <b>Frucht: Dicke der Schale</b>                    | <b>Fruto: espesor de la cáscara</b>                    |  |               |
| (*)        |   |  |  |  |  |               |
| <b>QN</b>  | <b>(d)</b> thin                             | fine   | dünn   | delgado  | Amarilla San José, Montesa, Reyna                                      | 3             |
|            | <b>(e)</b> 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<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|---------------|---|--|---|--|--|---------------|
| <b>45.</b>    | <b>Fruit: weight of peel</b>                | <b>Fruit: poids de la peau</b>                           | <b>Frucht: Gewicht der Schale</b>                           | <b>Fruto: peso de la cáscara</b>                           |  |               |
| <b>QN (d)</b> | light                                       | léger  | leicht  | ligero   | Roja Suanjuanera, Tuna Rosa  | 3             |
|               | medium                                      | moyen  | mittel  | medio  | Chapeada, Natalia  | 5             |
|               | heavy                                       | lourd  | schwer  | pesado   | Montesa , Torreoja   | 7             |
| <b>46.</b>    | <b>Fruit: weight of flesh</b>               | <b>Fruit: poids de la chair</b>                          | <b>Frucht: Gewicht des Fleisches</b>                        | <b>Fruto: peso de la pulpa</b>                             |  |               |
| <b>QN (d)</b> | 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             |
| <b>47.</b>    | <b>Fruit: ratio of weight of flesh/peel</b> | <b>Fruit: rapport poids de la chair/poids de la peau</b> | <b>Frucht: Verhältnis Gewicht des Fleisches/ der Schale</b> | <b>Fruto: relación peso de la pulpa/peso de la cáscara</b> |  |               |
| <b>QN (d)</b> | 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             |
| <b>48.</b>    | <b>Fruit: evenness of color of surface</b>  | <b>Fruit: uniformité de la couleur de la surface</b>     | <b>Frucht: Gleichmäßigkeit der Farbe der Oberfläche</b>     | <b>Fruto: uniformidad del color de la superficie</b>       |  |               |
| <b>QL (d)</b> | even  | uniforme   | gleichmäßig   | uniforme   | Burrona, Cristalina  | 1             |
|               | uneven                                      | irrégulière  | ungleichmäßig   | irregular  | Chapeado   | 2             |

|                   | English                                 | français   | deutsch                                      | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|-------------------|---|--|--|--|--|---------------|
| <b>49.</b><br>(*) | <b>Fruit: main color<br/>of surface</b> | <b>Fruit: couleur<br/>principale de la<br/>surface</b> | <b>Frucht: Hauptfarbe<br/>der Oberfläche</b> | <b>Fruto: color<br/>principal de la<br/>superficie</b> |  |               |
| <b>PQ (d)</b>     | 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,<br>Roja San Martín, Tapón<br>Aguanoso                    | 10            |
| <b>50.</b><br>(*) | <b>Fruit: color of<br/>flesh</b>        | <b>Fruit: couleur de la<br/>chair</b>                  | <b>Frucht: Farbe des<br/>Fleisches</b>       | <b>Fruto: color de la<br/>pulpa</b>                    |  |               |
| <b>PQ (d)</b>     | light green                             | vert clair   | hellgrün                                     | verde claro  | Cristalina, Esmeralda,<br>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,<br>Memelo   | 5             |
|                   | red                                     | rouge  | rot  | rojo   | Rojo Pelón, Rubí Reyna   | 6             |
|                   | purple                                  | pourpre  | purpurn                                      | púrpura  | Liria, Morada Jalpa,<br>Roja San Martín                                | 7             |

|                | English                                       | français   | deutsch                                      | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|----------------|---|--|--|--|--|---------------|
| <b>51.</b>     | <b>Fruit: firmness of flesh</b>               | <b>Fruit: fermeté de la chair</b>                        | <b>Frucht: Festigkeit des Fleisches</b>      | <b>Fruto: firmeza de la pulpa</b>                            |  |               |
| <b>QN (d)</b>  | soft  | molle  | weich  | blanda   | Memelo   | 3             |
|                | medium  | moyenne  | mittel                                       | media  | Cristalina   | 5             |
|                | firm  | ferme  | fest   | firme  | Fafayuca   | 7             |
| <b>52.</b>     | <b>Fruit: juiciness of flesh</b>              | <b>Fruit: jutosité de la chair</b>                       | <b>Frucht: Saftigkeit des Fleisches</b>      | <b>Fruto: jugosidad de la pulpa</b>                          |  |               |
| <b>QN (d)</b>  | low   | faible   | gering                                       | baja   | Amarilla Plátano, Memelo   | 3             |
|                | medium  | moyenne  | mittel                                       | media  | Reyna  | 5             |
|                | high  | forte  | hoch   | alta   | Burrona, Cristalina, Fafayuca  | 7             |
| <b>53. (*)</b> | <b>Fruit: number of fully developed seeds</b> | <b>Fruit: nombre de graines complètement développées</b> | <b>Frucht: Anzahl vollentwickelter Samen</b> | <b>Fruto: número de semillas completamente desarrolladas</b> |  |               |
| <b>QN (d)</b>  | few   | faible   | gering                                       | bajo   | Roja Sanjuanera  | 3             |
|                | medium  | moyen  | mittel                                       | medio  | Fafayuca, Solferino  | 5             |
|                | many  | élevé  | groß   | alto   | Tapón de Mayo, Cristalina  | 7             |
| <b>54. (*)</b> | <b>Seed: size</b>                             | <b>Graine: taille</b>                                    | <b>Samen: Größe</b>                          | <b>Semilla: tamaño</b>                                       |  |               |
| <b>QN (d)</b>  | 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             |

|                          | English                                | français                                  | deutsch  | español   | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|--------------------------|--|---|--|---|--|---------------|
| <b>55.</b><br>(*)<br>(+) | <b>Fruit: number of abortive seeds</b> | <b>Fruit: nombre de graines avortées</b>  | <b>Frucht: Anzahl verkümmerter Samen</b>                 | <b>Fruto: número de semillas abortivas</b>        |  |               |
| <b>QN</b>                | <b>(d)</b> 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             |
| <b>56.</b>               | <b>Fruit: total soluble solids</b>     | <b>Fruit: teneur en matières solubles</b> | <b>Frucht: Gesamtgehalt an löslicher Trockensubstanz</b> | <b>Fruto: contenido total de sólidos solubles</b> |  |               |
| <b>QN</b>                | <b>(d)</b> low                         | faible                                    | gering   | bajo  | Duraznilla   | 3             |
|                          | <b>(e)</b> medium                      | moyenne                                   | mittel   | medio   | Amarillo Plátano, Burrona  | 5             |
|                          | high                                   | forte                                     | hoch   | alto  | Copena L-12, Fafayuca, Rojo Pelón                                      | 7             |
| <b>57.</b>               | <b>Fruit: acidity</b>                  | <b>Fruit: acidité</b>                     | <b>Frucht: Säure</b>                                     | <b>Fruto: acidez</b>                              |  |               |
| <b>QN</b>                | <b>(d)</b> low                         | faible                                    | gering   | baja  | Blanca Larga   | 3             |
|                          | <b>(e)</b> medium                      | moyenne                                   | mittel   | media   | Fafayuca   | 5             |
|                          | high                                   | élevée                                    | hoch   | alta  | Blanca de Castilla   | 7             |

|                             | English   | français   | deutsch                                      | español  | Example Varieties<br>Exemples<br>Beispielssorten<br>Variedades ejemplo | Note/<br>Nota |
|-----------------------------|---|--|--|--|--|---------------|
| <b>58.<br/>(* )</b>         | <b>Time of beginning<br/>of flowering</b>             | <b>Époque du début de<br/>la floraison</b>         | <b>Zeitpunkt des<br/>Blühbeginns</b>         | <b>Época de comienzo<br/>de la floración</b>             |  |               |
| <b>QN</b>                   | early   | précoce  | früh   | temprana   | Sanjuanera, Tapón<br>Aguanoso  | 3             |
|                             | medium  | moyenne  | mittel                                       | media  | Pico Chulo, Reyna,<br>Rojo Pelón                                       | 5             |
|                             | late  | tardive  | spät   | tardía   | Burrona, Charola,<br>Cristalina  | 7             |
| <b>59.<br/>(* )</b>         | <b>Flowering habit</b>                                | <b>Floraison</b>                                   | <b>Blühverhalten</b>                         | <b>Tipo de floración</b>                                 |  |               |
| <b>QL</b>                   | once flowering  | fleurit une fois                                   | einmal blühend                               | una floración  | Cristalina, Reyna,<br>Rojo Pelón                                       | 1             |
|                             | twice flowering                                       | fleurit deux fois                                  | zweimal blühend                              | dos floraciones  | Cuaresmeño   | 2             |
| <b>60.<br/>(* )<br/>(+)</b> | <b>Time of harvest<br/>maturity</b>                   | <b>Époque de maturité<br/>de récolte</b>           | <b>Zeitpunkt der<br/>Erntereife</b>          | <b>Época de madurez<br/>para la cosecha</b>              |  |               |
| <b>QN</b>                   | 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,<br>Reyna  | 5             |
|                             | late  | tardive  | spät   | tardía   | Burrona, Esmeralda,<br>Fafayuca  | 7             |
|                             | very late   | très tardive                                       | sehr spät                                    | muy tardía   | Charola, Chaveña   | 9             |
| <b>61.</b>                  | <b>Duration of<br/>harvesting period<br/>of fruit</b> | <b>Durée de la période<br/>de récolte du fruit</b> | <b>Dauer der Periode<br/>der Fruchternte</b> | <b>Duración del<br/>período de cosecha<br/>del fruto</b> |  |               |
| <b>QN</b>                   | short   | courte   | kurz   | corta  | Chapeada, Torreaja   | 3             |
|                             | medium  | moyenne  | mittel                                       | media  | Pico Chulo, Reyna  | 5             |
|                             | long  | longue   | lang   | larga  | Burrona  | 7             |



8. Explanations on the Table of Characteristics

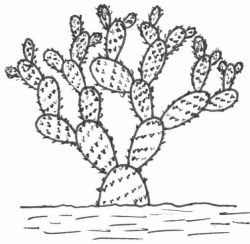
8.1 *Explanations covering several characteristics*

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

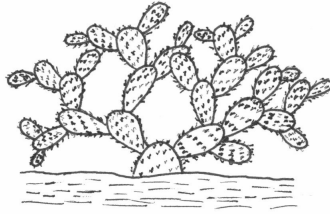
- (a) Cladodes: Unless otherwise stated all observations on the cladode should be made on mature cladodes, one to two years old.
- (b) Areoles, spines and glochides: Unless otherwise stated, all observations on the areole, spine and glochide should be made on intact cladodes or intact fruits as appropriate.
- (c) Flower: Unless otherwise stated all observations on the flower should be made at the peak of flowering time. All observations on 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*

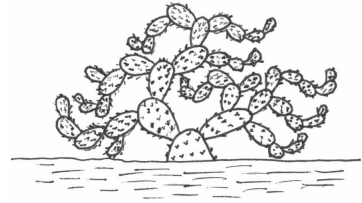
Ad. 1: Plant: growth habit



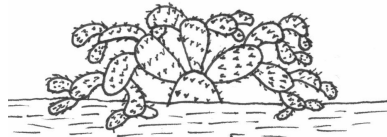
1  
upright



2  
spreading



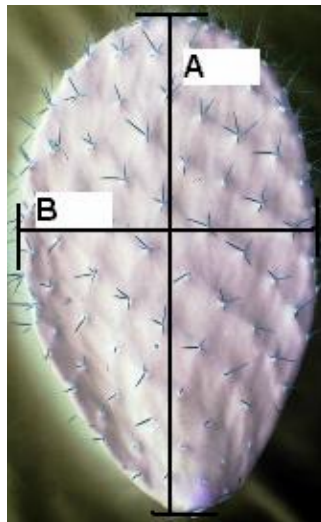
3  
decumbent



4  
drooping

Ad. 4: Cladode: length

Ad. 5: Cladode: width



A= length  
B= width

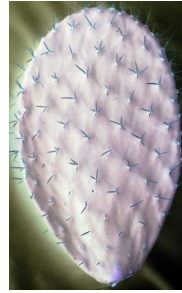
Ad. 7: Cladode: shape



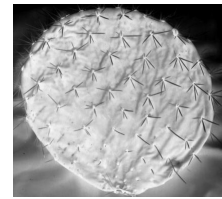
1  
narrow elliptic



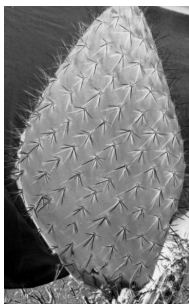
2  
medium elliptic



3  
broad elliptic



4  
circular



5  
rhombic

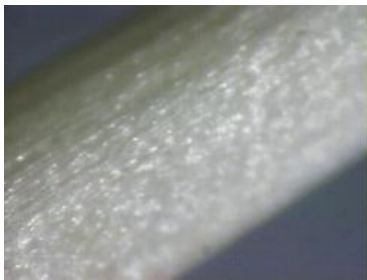


6  
narrow obovate



7  
broad obovate

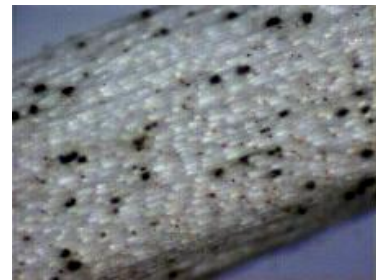
Ad. 19: Spine: surface



1  
smooth

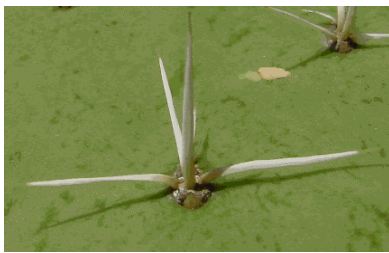


2  
grooved



3  
prickled

Ad. 20: Central spine: attitude



1  
erect

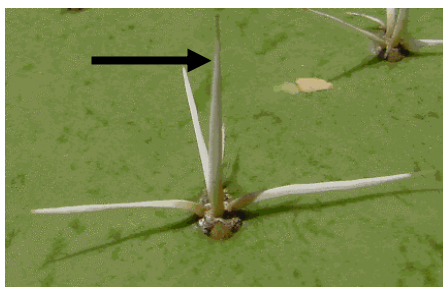


3  
semi-erect



5  
horizontal

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



1  
absent



9  
present

Ad. 23: Central spine: twisting



1  
absent



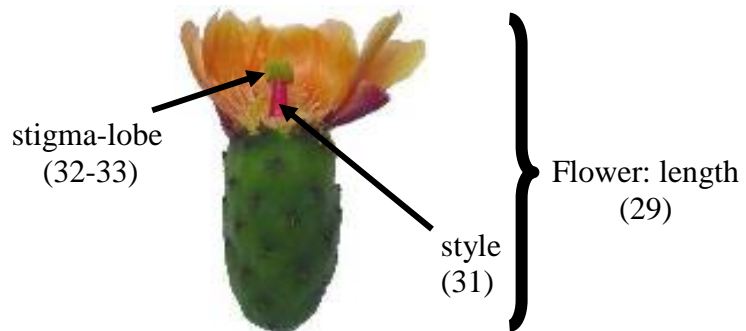
9  
present

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  
elliptic



4  
circular

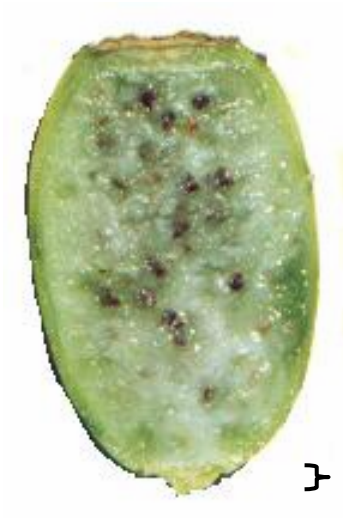


5  
oblate



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.

## 9. Literature

Barrientos P., F. 1984. "Der Anbau von Feigenkakteen (*Opuntia* spp.) in Mexico". Nutzung von Kakteen und ihre Problematik. Justus-Liebig Universität Giessen. Reihe I, Band. 11: 27-38.

Barrientos P., F.; Muratalla L., A.; Barrientos P., A.F. 1992. "New hybrids of *Opuntia*". In: Mabry, T. J.; Nguyen, H.T., Dixon, R.A. and Bonness, M.S. IC<sup>2</sup> Institute, University of Texas. Austin, Texas, USA. pp. 243-251.

Chessa, I.; Niedu, G., 1997. "Descriptors for cactus pear (*Opuntia* spp.)". CACTUESNET, FAO – Università degli Studi di Reggio Calabria. Rome, Italy. 39 p.

Gallegos V., C.; Blanco, F.; Noriega A., M.G., 1994. "Establecimiento de una colección de nopal (*Opuntia* spp.) en el CRUCEN, Zacatecas, México". Revista Geografía Agrícola 20: 137-141.

Gallegos V., C.; Valdez C., R.D.; Blanco M., F., 1996. "Evaluación y seguimiento de la colección de nopal (*Opuntia* spp.) en el CRUCEN, Zacatecas". In: R. Ortega P., E. Guízar N., E. Estrada M. y E. Cedillo P., Herbarios y Colecciones de Recursos Fitogenéticos de la Universidad Autónoma Chapingo: Antecedentes, Situación Actual y Perspectivas. SGI-DGA-Universidad Autónoma Chapingo. Chapingo, México. pp 69-80.

Granados S., D.; Castañeda P., A.D., 1991. "El Nopal, importancia, fisiología, genética e importancia frutícola". Editorial Trillas, México D.F. 227 p.

Mondragón J., C.; Fernández M., M.R.; Rodríguez A., J.; Flores V., C.A., 1995. "Propuesta de descriptor para el registro de nopal". In: E. Pimienta B., C. Neri L., A. Muñoz U. y F. M. Huerta Martínez. Conocimiento y Aprovechamiento del Nopal. VI Congreso Nacional y IV Congreso Internacional. Universidad de Guadalajara. Guadalajara, Jal. pp 127-131.

Muñoz, U. A., 1995. "Estudio anatómico, morfológico y citológico de seis variables de nopal tunero del Altiplano Potosino-Zacatecano". Tesis profesional, Colegio de Postgraduados, Montecillo, Texcoco. México. pp 10-15, 30.

Peralta M., V.M., 1983. "Caracterización fenológica y morfológica de formas de nopal (*Opuntia* spp.) de fruto (tuna) en el Altiplano Potosino-Zacatecano". Tesis Profesional. Universidad Autónoma de Aguascalientes. Aguascalientes, Ags. México 88 p.

Pimienta-Barrios, E., 1990. "El Nopal Tunero". Universidad de Guadalajara. Guadalajara, Jalisco. México. 246 p.

Pimienta-Barrios, E.; Loera-Quezada, M.; López-Amezcu, L. O., 1993. "Estudio anatómico comparativo en colectas del subgénero *Opuntia*". Agrociencia Serie Fitociencia 4(3): 7-21.

Reyes A., J.A.; Aguirre R., J.R., 1999. "Etnobotánica de *Opuntia* en la Altiplanicie Meridional de México". Instituto de Investigación de Zonas Desérticas, Universidad Autónoma de San Luis Potosí, S.L.P., México. 2 p.



Reyes A., J.A., 1999. "Taller sobre morfología de Opuntia". VIII Congreso Nacional y VI Internacional sobre el Conocimiento y Aprovechamiento del Nopal. Universidad Autónoma de San Luis Potosí. San Luis Potosí, S. L. P., México. 8 p.

Rodríguez S., E., 1992. "Caracterización de formas de nopal tunero en la Zacatecana, Guadalupe, Zac." Tesis Profesional. Facultad de Agronomía, Universidad Autónoma de Zacatecas. Zacatecas. Zac. 69 p.

Rodríguez S., E.; Nava C., A., 1999. "Nopal, Riqueza Agroecológica de México". COSNET, DGETA, Secretaría de Educación Pública. México, D. F. 160 p.

Scheinvar, L., 1999. "Biosistemática de los xoconostles mexicanos y su potencial económico". In: J.R. Aguirre R. y J.A. Reyes A. (eds.). VIII Congreso Nacional y VI Internacional sobre conocimiento y aprovechamiento del nopal. Universidad Autónoma de San Luis Potosí. San Luis Potosí, S.L.P., México. pp. 255-274.

10. Technical Questionnaire

|  |   |   |
|--|---|---|
| TECHNICAL QUESTIONNAIRE  | Page {x} of {y}   | Reference Number:   |
|  |   | Application date:<br>(not to be filled in by the applicant) |
| <b>TECHNICAL QUESTIONNAIRE</b><br>to be completed in connection with an application for plant breeders' rights |   |   |
| <b>1. Subject of the Technical Questionnaire</b>   |   |   |
| 1.1 <i>Latin Name</i>  | <input style="width: 90%; border: 1px solid black;" type="text" value="OPUNTIA, Group 1"/><br>Please state species: ..... | [ ]   |
| Common Name  | <input style="width: 90%; border: 1px solid black;" type="text" value="CACTUS PEAR"/>                                     |   |
| 1.2 <i>Latin Name</i>  | <input style="width: 90%; border: 1px solid black;" type="text" value="OPUNTIA, Group 2"/><br>Please state species: ..... | [ ]   |
| Common Name  | <input style="width: 90%; border: 1px solid black;" type="text" value="XOCONOSTLES"/>                                     |   |
| <b>2. Applicant</b>  |   |   |
| Name   | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| Address  | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| Telephone No.  | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| Fax No.  | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| E-mail address   | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| Breeder (if different from applicant)  | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| <b>3. Proposed denomination and breeder's reference</b>  |   |   |
| Proposed denomination (if available)   | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |
| Breeder's reference  | <input style="width: 95%; border: 1px solid black;" type="text"/>   |   |

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

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)

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)  [ ]

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

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 |
|---------------------------|----------------------------------|---------------------------------------|------|
| <b>5.1</b><br><b>(14)</b> | <b>Cladode: color of areoles</b> |                                       |      |
|                           | grey                             | Milpa Alta, Reyna                     | 1[ ] |
|                           | yellow brown                     | Burrona                               | 2[ ] |
|                           | brown                            | Chaveña                               | 3[ ] |
|                           | black                            | Cardón                                | 4[ ] |
| <b>5.2</b><br><b>(44)</b> | <b>Fruit: thickness of peel</b>  |                                       |      |
|                           | thin                             | Amarilla San José, Montesa, Reyna     | 3[ ] |
|                           | medium                           | Rojo Lirio, Rojo Pelón, Tapón de Mayo | 5[ ] |
|                           | thick                            | Caidilla Legítima                     | 7[ ] |
| <b>5.3</b><br><b>(54)</b> | <b>Seed: size</b>                |                                       |      |
|                           | small                            | Cardón, Cascarona, Curesmeño          | 3[ ] |
|                           | medium                           | Pico Chulo, Reyna                     | 5[ ] |
|                           | large                            | Blanca San José, Burrona, Chapeada    | 7[ ] |
| <b>5.4</b><br><b>(59)</b> | <b>Flowering habit</b>           |                                       |      |
|                           | once flowering                   | Cristalina, Reyna, Rojo Pelón         | 1[ ] |
|                           | twice flowering                  | Cuaresmeño                            | 2[ ] |
| <b>5.5</b><br><b>(60)</b> | <b>Time of harvest maturity</b>  |                                       |      |
|                           | 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[ ] |

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

6. Similar varieties and differences from these varieties

| 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 <b>similar</b> variety(ies) | Describe the expression of the characteristic(s) for <b>your</b> candidate variety |
|---|---|--|--|
| <i>Example</i>  | <i>Fruit: length</i>  | <i>short</i>   | <i>medium</i>  |
|   |   |  |  |
|   |   |  |  |

Comments:

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

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

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. Information on plant material to be examined.

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 or pesticide) | Yes [ ] | No [ ] |
| (c) Tissue culture  | Yes [ ] | No [ ] |
| (d) Other factors   | Yes [ ] | No [ ] |

Please provide details of 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 | <input type="text"/> |      |                      |
| Signature        | <input type="text"/> | Date | <input type="text"/> |

[End of document]