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|  |  | **E**  **TG/104/5 Rev. 3(proj.1)**  **ORIGINAL:** English  DATE: 2024-06-05 |
| **INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS** | | |
| GENEVA | | |

DRAFT

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|  | **MELON**  UPOV Code: CUCUM\_MEL  *Cucumis melo* L. | [[1]](#footnote-1)\* |

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

Alternative Names:\*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
| *Cucumis melo* L. | Melon | Melon | Melone | Melón |

The purpose of these guidelines (“Test Guidelines”) is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

**ASSOCIATED DOCUMENTS**

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

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# Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Cucumis melo* L.

# 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 seed.

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

100 g or 2000 seeds.

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

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

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

# Method of Examination

## 3.1 Number of Growing Cycles

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

## 3.2 Testing Place

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

## 3.3 Conditions for Conducting the Examination

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

MG: single measurement of a group of plants or parts of plants

MS: measurement of a number of individual plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

## 3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 20 plants, which should be divided between two or more replicates.

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 20 plants or parts taken from each of 20 plants.

## 3.6 Additional Tests

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

# Assessment of Distinctness, Uniformity and Stability

## 4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

## 4.2 Uniformity

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

4.2.2 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.3 For the assessment of uniformity of self‑pollinated varieties, vegetatively propagated varieties and hybrid varieties, a population standard of 1 % and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 20 plants, 1 off-type is allowed.

## 4.3 Stability

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

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

4.3.3 Where appropriate, or in cases of doubt, the stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

# Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Inflorescence: sex expression (at full flowering) (characteristic 12)

(b) Fruit: shape in longitudinal section (characteristic 28)

(c) Fruit: ground color of skin (characteristic 29)

(d) Fruit: warts (characteristic 38)

(e) Fruit: grooves (characteristic 43)

(f) Fruit: cork formation (characteristic 48)

(g) Fruit: main color of flesh (characteristic 54)

(h) Seed: length (characteristic 60)

(i) Seed: color (characteristic 63)

(j) Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom)*,* Race 0 (Fom: 0) (characteristic 69.1)

(k) Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom)*,* Race 1 (Fom: 1) (characteristic 69.2)

(l) Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom)*,* Race 2 (Fom: 2) (characteristic 69.3)

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

# Introduction to the Table of Characteristics

## 6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

## 6.2 States of Expression and Corresponding Notes

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

## 6.3 Types of Expression

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

## 6.4 Example Varieties

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

## 6.5 Legend

(\*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3

QN: Quantitative characteristic – see Chapter 6.3

PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG: See Chapter 3.3

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

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

# Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

|  |  | English | français | deutsch | español | Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | VG | Seedling: length of hypocotyl | Plantule: longueur de l’hypocotyle | Keimpflanze: Länge des Hypokotyls | Plántula: longitud del hipocótilo |  |  |
| **QN** | **(a)** | very short | très court | sehr kurz | muy corto | Golden Crispy | 1 |
|  |  | short | court | kurz | corto | Arava, Clipper | 3 |
|  |  | medium | moyen | mittel | medio | Doral, Futuro | 5 |
|  |  | long | long | lang | largo | Bimbo, Ronda | 7 |
|  |  | very long | très long | sehr lang | muy largo | Noy | 9 |
| 2. | VG | Seedling: size of cotyledon | Plantule: taille du cotylédon | Keimpflanze: Größe der Keimblätter | Plántula: tamaño del cotiledón |  |  |
| **QN** | **(a)** | very small | très petit | sehr klein | muy pequeño | Golden Crispy | 1 |
|  |  | small | petit | klein | pequeño | Candy, Lunasol | 3 |
|  |  | medium | moyen | mittel | medio | Futuro, Sancho | 5 |
|  |  | large | grand | groß | grande | Bimbo, Nicolás | 7 |
|  |  | very large | très grand | sehr groß | muy grande | Noy | 9 |
| 3. | VG | Seedling: intensity of green color of cotyledon | Plantule: intensité de la couleur verte du cotylédon | Keimpflanze: Intensität der Grünfärbung der Keimblätter | Plántula: intensidad del color verde del cotiledón |  |  |
| **QN** | **(a)** | light | clair | hell | claro | Bimbo, Lucas | 3 |
|  |  | medium | moyen | mittel | medio | Candy, Piel de Sapo | 5 |
|  |  | dark | foncé | dunkel | oscuro | Clipper, Lunasol | 7 |
| 4. | VG | Leaf blade: size | Limbe: taille | Blattspreite: Größe | Limbo: tamaño |  |  |
| **QN** | **(b)** | small | petit | klein | pequeño | Geaprince, Lunasol | 3 |
|  |  | medium | moyen | mittel | medio | Candy, Total | 5 |
|  |  | large | grand | groß | grande | Don, Sucrero | 7 |
| 5. | VG | Leaf blade: intensity of green color | Limbe: intensité de la couleur verte | Blattspreite: Intensität der Grünfärbung | Limbo: intensidad del color verde |  |  |
| **QN** | **(b)** | light | clair | hell | claro | Fimel, Yuma | 3 |
|  |  | medium | moyen | mittel | medio | Doral, Galia | 5 |
|  |  | dark | foncé | dunkel | oscuro | Gama, Gustal | 7 |
| 6.  (+) | VG | Leaf blade: development of lobes | Limbe: développement des lobes | Blattspreite: Ausprägung der Lappen | Limbo: desarrollo de los lóbulos |  |  |
| **QN** | **(b)** | weak | faible | gering | débil | Boule d’or | 3 |
|  |  | medium | moyen | mittel | medio | Piel de Sapo | 5 |
|  |  | strong | fort | stark | fuerte | Galia | 7 |
| 7.  (+) | VG | Leaf blade: length of terminal lobe | Limbe: longueur du lobe terminal | Blattspreite: Länge des Endlappens | Limbo: longitud del lóbulo terminal |  |  |
| **QN** | **(b)** | short | court | kurz | corto | Perlita | 3 |
|  |  | medium | moyen | mittel | medio | Clipper, Gama | 5 |
|  |  | long | long | lang | largo | Gustal, Primal | 7 |
| 8. | VG | Leaf blade: dentation of margin | Limbe: dentelure du bord | Blattspreite: Randzähnung | Limbo: dentado del margen |  |  |
| **QN** | **(b)** | weak | faible | gering | débil | Clipper, Védrantais | 3 |
|  |  | medium | moyenne | mittel | medio | De Cavaillon espagnol, Piel de Sapo | 5 |
|  |  | strong | forte | stark | fuerte | Boule d’or, Portoluz | 7 |
| 9. | VG | Leaf blade: blistering | Limbe: cloqûre | Blattspreite: Blasigkeit | Limbo: abullonado |  |  |
| **QN** | **(b)** | weak | faible | gering | débil | Galia | 3 |
|  |  | medium | moyenne | mittel | medio | Costa | 5 |
|  |  | strong | forte | stark | fuerte | Haros | 7 |
| 10. | VG | Petiole: attitude | Pétiole: port | Blattstiel: Haltung | Pecíolo: porte |  |  |
| **QN** | **(b)** | erect | dressé | aufrecht | erecto | Alfredo | 1 |
|  |  | semi-erect | demi‑dressé | halbaufrecht | semierecto | Peko | 3 |
|  |  | horizontal | horizontal | waagerecht | horizontal | Creso | 5 |
| 11. | VG/MS | Petiole: length | Pétiole: longueur | Blattstiel: Länge | Pecíolo: longitud |  |  |
| **QN** | **(b)** | short | court | kurz | corto | Costa | 3 |
|  |  | medium | moyen | mittel | medio | Arava, Sancho | 5 |
|  |  | long | long | lang | largo | Goldgen | 7 |
| 12. (\*) | VG | Inflorescence: sex expression (at full flowering) | Inflorescence: expression du sexe (en pleine floraison) | Blütenstand: Geschlechts-verteilung (bei Vollblüte) | Inflorescencia: expresión del sexo (en plena floración) |  |  |
| **QL** |  | monoecious | monoïque | monözisch | monócico | Alpha, Categoría | 1 |
|  |  | andromonoecious | andromonoïque | andromonözisch | andromonócico | Piel de Sapo | 2 |
| 13.  (+) | VG | Young fruit: hue of green color of skin | Jeune fruit: teinte de couleur verte de l’épiderme | Junge Frucht: Farbton der Grünfärbung der Schale | Fruto joven: tonalidad del color verde de la piel |  |  |
| **PQ** | **(c)** | whitish green | vert blanchâtre | weißlichgrün | verde blanquecino | Geasol | 1 |
|  |  | yellowish green | vert jaunâtre | gelblichgrün | verde amarillento | Fimel | 2 |
|  |  | green | vert | grün | verde | Lucas | 3 |
|  |  | greyish green | vert grisâtre | gräulichgrün | verde grisáceo | Spanglia | 4 |
| 14. (\*) | VG | Young fruit: intensity of green color of skin | Jeune fruit: intensité de la couleur verte de l’épiderme | Junge Frucht: Intensität der Grünfärbung der Schale | Fruto joven: intensidad del color verde de la piel |  |  |
| **QN** | **(c)** | very light | très clair | sehr hell | muy clara | Solarking | 1 |
|  |  | light | clair | hell | clara | Fimel | 3 |
|  |  | medium | moyen | mittel | media | Eros | 5 |
|  |  | dark | foncé | dunkel | oscura | Galia | 7 |
|  |  | very dark | très foncé | sehr dunkel | muy oscura | Edén | 9 |
| 15. | VG | Young fruit: density of dots | Jeune fruit: densité des points | Junge Frucht: Dichte der Punkte | Fruto joven: densidad de los puntos |  |  |
| **QN** | **(c)** | absent or very sparse | nulle ou très lâche | fehlend oder sehr locker | ausente o muy baja | Solarking | 1 |
|  |  | sparse | lâche | locker | baja | Fimel | 3 |
|  |  | medium | moyenne | mittel | media | Lucas | 5 |
|  |  | dense | dense | dicht | densa | Arava | 7 |
|  |  | very dense | très dense | sehr dicht | muy densa | Edén | 9 |
| 16. | VG | Young fruit:  size of dots | Jeune fruit: taille des points | Junge Frucht: Größe der Punkte | Fruto joven: tamaño de los puntos |  |  |
| **QN** | **(c)** | small | petits | klein | pequeño | Lucas | 3 |
|  |  | medium | moyens | mittel | medio | Arava | 5 |
|  |  | large | grands | groß | grande | Spanglia | 7 |
| 17. | VG | Young fruit: contrast of dot color/ground color | Jeune fruit: contraste couleur des points/couleur de fond | Junge Frucht: Kontrast Farbe der Punkte/Grundfarbe | Fruto joven: contraste del color de los puntos/color del fondo |  |  |
| **QN** | **(c)** | weak | faible | gering | débil | Lucas | 3 |
|  |  | medium | moyen | mittel | medio | Arava | 5 |
|  |  | strong | fort | stark | fuerte | Total | 7 |
| **18.** | **VG** | **Young fruit: conspicuousness of groove coloring** | **Jeune fruit: netteté de la coloration du sillon** | **Junge Frucht: Deutlichkeit der Färbung der Furchen** | **Fruto joven: evidencia de conspicuidad de los surcos** |  |  |
| **QN** | **(c)** | absent or very weak | nulle ou très faible | fehlend oder sehr gering | ausente o muy débil | Solarking | 1 |
|  |  | weak | faible | gering | débil | Geaprince, Total | 3 |
|  |  | medium | moyenne | mittel | media | Gama | 5 |
|  |  | strong | forte | stark | fuerte | Clipper, Galia | 7 |
|  |  | very strong | très forte | sehr stark | muy fuerte | Nembo | 9 |
| 19. | VG | Young fruit: intensity of groove coloring | Jeune fruit: intensité de la coloration du sillon | Junge Frucht: Intensität der Färbung der Furchen | Fruto joven: intensidad del color de los surcos |  |  |
| **QN** | **(c)** | light | claire | hell | clara |  | 3 |
|  |  | medium | moyenne | mittel | media | Gama, Topper | 5 |
|  |  | dark | foncée | dunkel | oscura | Century, Drake | 7 |
| 20. | VG/MS | Young fruit: length of peduncle | Jeune fruit: longueur du pédoncule | Junge Frucht: Länge des Stiels | Fruto joven: longitud del pedúnculo |  |  |
| **QN** | **(c)** | short | court | kurz | corto | Lince Haros | 3 |
|  |  | medium | moyen | mittel | medio | Arava, Romeo | 5 |
|  |  | long | long | lang | largo | Corín | 7 |
| 21. | VG/MS | Young fruit: thickness of peduncle 1 cm  from fruit | Jeune fruit: grosseur du pédoncule à 1 cm du fruit | Junge Frucht: Dicke des Stiels 1 cm von der Ansatzstelle der Frucht | Fruto joven: grosor del pedúnculo 1 cm a partir del fruto |  |  |
| **QN** | **(c)** | thin | fin | dünn | delgado | Solarking | 3 |
|  |  | medium | moyen | mittel | medio | Geaprince, Védrantais | 5 |
|  |  | thick | gros | dick | grueso | Charentais, Doral | 7 |
| 22. | VG | Young fruit: extension of darker area around peduncle | Jeune fruit: taille de la zone plus foncée autour du pédoncule | Junge Frucht: Ausdehnung der dunkleren Zone um den Stiel | Fruto joven: extensión del área más oscura alrededor del pedúnculo |  |  |
| **QN** | **(c)** | absent or very small | absente ou très petite | fehlend oder sehr klein | ausente o muy pequeña | Doral | 1 |
|  |  | small | petite | klein | pequeña | Boule d’or | 3 |
|  |  | medium | moyenne | mittel | media | Mirasol Geaprince | 5 |
|  |  | large | large | groß | grande |  | 7 |
| 23.  (+) | VG | Fruit: change of skin color from young fruit to maturity | Fruit: changement de couleur de l’épiderme du jeune fruit au fruit à maturité | Frucht: Änderung der Farbe der Schale von der jungen Frucht bis zur Reife | Fruto: cambio de color de la piel del fruto joven a la madurez |  |  |
| **QN** |  | early in fruit development | au début du développement du fruit | früh in der Fruchtentwicklung | a principios del desarrollo del fruto | Alpha, Charantais, Clipper | 1 |
|  |  | late in fruit development | tardivement lors du développement du fruit | spät in der Fruchtentwicklung | a finales del desarrollo del fruto | Amarillo Oro, Galia | 2 |
|  |  | very late in fruit development or no change | très tardivement lors du développement du fruit ou sans changement | sehr spät in der Fruchtentwicklung | muy al final del desarrollo del fruto o sin cambios | Futuro, Piel de Sapo | 3 |
| 24. (\*) | VG/MS | Fruit: length | Fruit: longueur | Frucht: Länge | Fruto: longitud |  |  |
| **QN** | **(d)** | very short | très court | sehr kurz | muy corto | Doublon,  Golden Crispy | 1 |
|  |  | short | court | kurz | corto | Topper, Védrantais | 3 |
|  |  | medium | moyen | mittel | medio | Marina, Spanglia | 5 |
|  |  | long | long | lang | largo | Categoría, Toledo | 7 |
|  |  | very long | très long | sehr lang | muy largo | Katsura Giant, Valdivia | 9 |
| 25. (\*) | VG/MS | Fruit: diameter | Fruit: diamètre | Frucht: Durchmesser | Fruto: diámetro |  |  |
| **QN** | **(d)** | very narrow | très étroit | sehr klein | muy estrecho | Banana, Golden Crispy | 1 |
|  |  | narrow | étroit | klein | estrecho | Alpha, Maestro | 3 |
|  |  | medium | moyen | mittel | medio | Categoría, Galia | 5 |
|  |  | broad | large | groß | ancho | Albino, Kinka | 7 |
|  |  | very broad | très large | sehr groß | muy ancho | Noir des Carmes | 9 |
| 26. (\*) | VG/MS | Fruit: ratio length/diameter | Fruit: rapport longueur/diamètre | Frucht: Verhältnis Länge/Durchmesser | Fruto: relación longitud/diámetro |  |  |
| **QN** | **(d)** | very small | très petit | sehr klein | muy pequeña | Noir des Carmes | 1 |
|  |  | very small to small | très petit à petit | sehr klein bis klein | muy pequeña a pequeña | Alpha, Arava | 2 |
|  |  | small | petit | klein | pequeña | Buster, Supermarket | 3 |
|  |  | small to medium | petit à moyen | klein bis mittel | pequeña a media | Aril, Edén | 4 |
|  |  | medium | moyen | mittel | media | Doral, Tendral Negro | 5 |
|  |  | medium to large | moyen à grand | mittel bis groß | media a grande | Sirocco, Verdol | 6 |
|  |  | large | grand | groß | grande | Categoría, Futuro | 7 |
|  |  | large to very large | grand à très grand | groß bis sehr groß | grande a muy grande | Iguana, Canador | 8 |
|  |  | very large | très grand | sehr groß | muy grande | Banana | 9 |
| **27. (\*) (+)** | **VG** | **Fruit: position of maximum diameter** | **Fruit: localisation du diamètre maximal** | **Frucht: Position des maximalen Durchmessers** | **Fruto: posición del diámetro máximo** |  |  |
| **QN** | **(d)** | toward stem end | vers la base | zum Stielende hin | hacia la base del tallo | Piolín , Sapo de Oro | 1 |
|  |  | at middle | au milieu | in der Mitte | en el medio | Piel de Sapo, Védrantais | 2 |
|  |  | toward blossom end | vers le sommet | zum Blütenende hin | hacia el ápice | Cganchi, Edén, Katsura Giant | 3 |
| 28. (\*) (+) | VG | Fruit: shape in longitudinal section | Fruit: forme en section longitudinale | Frucht: Form im Längsschnitt | Fruto: forma en sección longitudinal |  |  |
| **PQ** | **(d)** | ovate | ovale | eiförmig | oval | De Cavaillon, Piolín | 1 |
|  |  | medium elliptic | elliptique moyen | mittel elliptisch | elíptica media | Piel de Sapo | 2 |
|  |  | broad elliptic | elliptique large | breit elliptisch | elíptica ancha | Corin, Sardo | 3 |
|  |  | circular | circulaire | rund | circular | Alpha, Galia | 4 |
|  |  | quadrangular | rectangulaire | quadratisch | cuadrangular | Zatta | 5 |
|  |  | oblate | aplati | breitrund | oblata | Jívaro, Noir de Carmes | 6 |
|  |  | obovate | obovale | verkehrt eiförmig | oboval | Cganchi | 7 |
|  |  | elongated | allongé | länglich | alargada | Alficoz, Banana | 8 |
| 29. (\*) (+) | VG | Fruit: ground color of skin | Fruit: couleur de fond de l’épiderme | Frucht: Grundfarbe der Schale | Fruto: color de fondo de la piel |  |  |
| **PQ** | **(d)** | white | blanc | weiß | blanco | Albino, Honey Dew | 1 |
|  |  | yellow | jaune | gelb | amarillo | Amarillo-Canario, Edén, Galia, Passport, Solarking | 2 |
|  |  | green | vert | grün | verde | Gohyang, Piel de Sapo | 3 |
|  |  | grey | gris | grau | gris | Geaprince, Geamar, Romeo, Sirio, Supporter, Védrantais | 4 |
| 30. | VG | Fruit: intensity of ground color of skin | Fruit: intensité de la couleur de fond de l’épiderme | Frucht: Intensität der Grundfarbe der Schale | Fruto: intensidad del color de fondo de la piel |  |  |
| **QN** | **(d)** | light | clair | hell | claro |  | 3 |
|  |  | medium | moyen | mittel | medio |  | 5 |
|  |  | dark | foncé | dunkel | oscuro |  | 7 |
| 31.  (+) | VG | Fruit: hue of ground color of skin | Fruit: teinte de la couleur de fond de l’épiderme | Frucht: Grundfarbton der Schale | Fruto: tonalidad del color de fondo de la piel |  |  |
| **PQ** | **(d)** | absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | Amarillo-Canario, Albino, Piel de Sapo, Sirio | 1 |
|  |  | whitish | blanchâtre | weißlich | blanquecina | Romeo | 2 |
|  |  | yellowish | jaunâtre | gelblich | amarillenta | Geaprince, Supporter | 3 |
|  |  | orange | orange | orange | anaranjada | Edén | 4 |
|  |  | ochre | ocre | ocker | ocre | Passport | 5 |
|  |  | greenish | verdâtre | grünlich | verdosa | Geamar, Honey Dew, Solarking | 6 |
|  |  | greyish | grisâtre | gräulich | grisácea | Gohyang | 7 |
| 32. | VG | Fruit: density of dots | Fruit: densité des points | Frucht: Dichte der Punkte | Fruto: densidad de los puntos |  |  |
| **QN** | **(d)** | absent or very sparse | nulle ou très lâche | fehlend oder sehr locker | ausente o muy baja | Charentais | 1 |
|  |  | sparse | lâche | locker | baja |  | 3 |
|  |  | medium | moyenne | mittel | media | Petit Gris de Rennes | 5 |
|  |  | dense | forte | dicht | densa | Piel de Sapo | 7 |
|  |  | very dense | très forte | sehr dicht | muy densa | Albino | 9 |
| 33. | VG | Fruit: size of dots | Fruit: taille des points | Frucht: Größe der Punkte | Fruto: tamaño de los puntos |  |  |
| **QN** | **(d)** | small | petits | klein | pequeño | Doral | 3 |
|  |  | medium | moyens | mittel | medio | Toledo | 5 |
|  |  | large | gros | groß | grande | Futuro | 7 |
| 34. | VG | Fruit: color of dots | Fruit: couleur des points | Frucht: Farbe der Punkte | Fruto: color de los puntos |  |  |
| **PQ** | **(d)** | white | blancs | weiß | blanco | Edén | 1 |
|  |  | yellow | jaunes | gelb | amarillo | Piel de Sapo | 2 |
|  |  | green | verts | grün | verde | Tendral Negro | 3 |
| 35. | VG | Fruit: intensity of color of dots | Fruit: intensité de la couleur des points | Frucht: Intensität der Farbe der Punkte | Fruto: intensidad del color de los puntos |  |  |
| **QN** | **(d)** | light | claire | hell | claro | Kinka, Mesol | 3 |
|  |  | medium | moyenne | mittel | medio | Sapiel, Toledo | 5 |
|  |  | dark | foncée | dunkel | oscuro | Soprano, Víctor | 7 |
| 36. (\*) | VG | Fruit: density of patches | Fruit: densité des taches | Frucht: Dichte der Flecken | Fruto: densidad de las manchas |  |  |
| **QN** | **(d)** | absent or very sparse | nulle ou très lâche | fehlend oder sehr locker | ausente o muy baja | Rochet | 1 |
|  |  | sparse | lâche | locker | baja |  | 3 |
|  |  | medium | moyenne | mittel | media | Braco | 5 |
|  |  | dense | dense | dicht | densa | Piel de Sapo | 7 |
|  |  | very dense | très dense | sehr dicht | muy densa | Oranje Ananas | 9 |
| 37. | VG | Fruit: size of patches | Fruit: taille des taches | Frucht: Größe der Flecken | Fruto: tamaño de las manchas |  |  |
| **QN** | **(d)** | small | petites | klein | pequeño | Baltasar | 3 |
|  |  | medium | moyennes | mittel | medio | Sancho | 5 |
|  |  | large | grosses | groß | grande | Taurus | 7 |
| 38. (\*) | VG | Fruit: warts | Fruit: verrues | Frucht: Warzen | Fruto: verrugas |  |  |
| **QL** | **(d)** | absent | absentes | fehlend | ausentes | Piel de Sapo | 1 |
|  |  | present | présentes | vorhanden | presentes | Zatta | 9 |
| 39. (\*) | VG | Fruit: strength of attachment of peduncle at maturity | Fruit: fermeté de la fixation du pédoncule à maturité | Frucht: Festigkeit des Anhaftens des Stiels bei Reife | Fruto: firmeza de la adherencia del pedúnculo en la madurez |  |  |
| **QN** | **(d)** | very weak | très faible | sehr gering | muy débil | Edén | 1 |
|  |  | weak | faible | gering | débil | Arava, Maestro | 3 |
|  |  | medium | moyenne | mittel | medio | Doral, Védrantais | 5 |
|  |  | strong | forte | stark | fuerte | Clipper, Costa | 7 |
|  |  | very strong | très forte | sehr stark | muy fuerte | Daimiel, Eloro | 9 |
| 40. (\*)  (+) | VG | Fruit: shape of base | Fruit: forme de la base | Frucht: Form der Basis | Fruto: forma de la base |  |  |
| **PQ** | **(d)** | pointed | pointue | spitz | puntiaguda | Edén | 1 |
|  |  | rounded | arrondie | abgerundet | redondeada | Arava | 2 |
|  |  | truncate | tronquée | abgeflacht | truncada | Zatta | 3 |
| 41. (\*) (+) | VG | Fruit: shape of apex | Fruit: forme du sommet | Frucht: Form der Spitze | Fruto: forma del ápice |  |  |
| **PQ** | **(d)** | pointed | pointue | spitz | puntiagudo | Canador, Futuro | 1 |
|  |  | rounded | arrondie | abgerundet | redondeado | Alpha, Honey Dew | 2 |
|  |  | truncate | tronquée | abgeflacht | truncado | Noir des Carmes | 3 |
| 42. (\*) | VG | Fruit: size of pistil scar | Fruit: taille de l’attache pistillaire | Frucht: Größe der Griffelnarbe | Fruto: forma del tamaño de la cicatriz pistilar |  |  |
| **QN** | **(d)** | small | petite | klein | pequeña | Alpha, Categoría | 3 |
|  |  | medium | moyenne | mittel | media | Charentais, Eros, Verdol | 5 |
|  |  | large | grande | groß | grande | Drake, Supermarket | 7 |
| 43. (\*) | VG | Fruit: grooves | Fruit: sillons | Frucht: Furchen | Fruto: surcos |  |  |
| **QL** | **(d)** | absent or very weakly expressed | absents ou très faiblement exprimés | fehlend oder sehr schwach ausgeprägt | ausentes o muy débilmente definidos | Piel de Sapo, Arava | 1 |
|  |  | weakly expressed | faiblement exprimés | schwach ausgeprägt | débilmente definidos | Total, Hobby | 2 |
|  |  | strongly expressed | fortement exprimés | stark ausgeprägt | fuertemente definidos | Védrantais, Galia | 3 |
| 44. | VG | Fruit: width of grooves | Fruit: largeur des sillons | Frucht: Breite der Furchen | Fruto: anchura de los surcos |  |  |
| **QN** | **(d)** | narrow | étroits | schmal | estrecho | Auraprince | 3 |
|  |  | medium | moyens | mittel | medios | Biga | 5 |
|  |  | broad | larges | breit | anchos | Nembo, Sirio | 7 |
| 45. | VG | Fruit: depth of grooves | Fruit: profondeur des sillons | Frucht: Tiefe der Furchen | Fruto: profundidad de los surcos |  |  |
| **QN** | **(d)** | very shallow | très peu profonds | sehr flach | muy superficial | Amber | 1 |
|  |  | shallow | peu profonds | flach | superficial | Galia | 3 |
|  |  | medium | moyens | mittel | media | Alpha | 5 |
|  |  | deep | profonds | tief | profunda | Panamá, Supermarket | 7 |
|  |  | very deep | très profonds | sehr tief | muy profunda | Noir des Carmes, Sucrin de Tours | 9 |
| 46. | VG | Fruit: color of grooves | Fruit: couleur des sillons | Farbe der Furchen | Fruto: color de los surcos |  |  |
| **PQ** | **(d)** | white | blancs | weiß | blanco | Geumssaraki | 1 |
|  |  | yellow | jaunes | gelb | amarillo | Futuro, Galia | 2 |
|  |  | green | verts | grün | verde | Charentais | 3 |
| 47. (\*) (+) | VG | Fruit: creasing of surface | Fruit: aspect ridé de la surface | Frucht: Faltenbildung der Oberfläche | Fruto: rugosida de la superficie |  |  |
| **QN** | **(d)** | absent or very weak | absent ou très faible | fehlend oder sehr gering | ausente o muy débil | Védrantais | 1 |
|  |  | weak | faible | gering | débil | Melchor, Sirocco | 3 |
|  |  | medium | moyen | mittel | medio | Costa, Piolín | 5 |
|  |  | strong | fort | stark | fuerte | Tendral Negro | 7 |
|  |  | very strong | très fort | sehr stark | muy fuerte | Balbey, Kirkagac | 9 |
| 48. (\*) | VG | Fruit:  cork formation | Fruit: broderie | Frucht: Korkbildung | Fruto: formación suberosa |  |  |
| **QL** | **(d)** | absent | absente | fehlend | ausente | Alpha | 1 |
|  |  | present | présente | vorhanden | presente | Dalton | 9 |
| 49. (\*) | VG | Fruit: thickness of cork layer | Fruit: épaisseur de la broderie | Frucht: Dicke der Korkschicht | Fruto: grosor de la capa suberosa |  |  |
| **QN** | **(d)** | very thin | très fine | sehr dünn | muy delgado | Amarillo Oro | 1 |
|  |  | thin | fine | dünn | delgado | Riosol, Védrantais | 3 |
|  |  | medium | moyenne | mittel | medio | Marina | 5 |
|  |  | thick | épaisse | dick | grueso | Geamar, PMR 45 | 7 |
|  |  | very thick | très épaisse | sehr dick | muy grueso | Honey Rock, Perlita | 9 |
| 50. (\*) | VG | Fruit: pattern of cork formation | Fruit: répartition de la broderie | Frucht: Muster der Korkbildung | Fruto: distribución de la formación suberosa |  |  |
| **PQ** | **(d)** | dots only | ponctuelle seulement | nur punktförmig | únicamente en puntos | Hermes, Védrantais | 1 |
|  |  | dots and linear | ponctuelle et linéaire | punktförmig und linear | en puntos y lineal | Jívaro, Topper | 2 |
|  |  | linear only | linéaire seulement | nur linear | únicamente lineal | Futuro, Riosol | 3 |
|  |  | linear and netted | linéaire et en résille | linear und netzförmig | lineal y reticulada | Anatol, Chantal | 4 |
|  |  | netted only | en résille seulement | nur netzförmig | únicamente reticulada | Galia, Perlita | 5 |
| 51. (\*) | VG | Fruit: density of pattern of cork formation | Fruit: densité de la broderie | Frucht: Dichte des Musters der Korkbildung | Fruto: densidad de la distribución de la formación suberosa |  |  |
| **QN** | **(d)** | very sparse | très lâche | sehr locker | muy baja | Alpha, Amarillo Oro | 1 |
|  |  | sparse | lâche | locker | baja | Védrantais | 3 |
|  |  | medium | moyenne | mittel | media | Regal, Vital | 5 |
|  |  | dense | compacte | dicht | densa | Galia, Geamar | 7 |
|  |  | very dense | très compacte | sehr dicht | muy densa | Honey Rock, Perlita | 9 |
| 52.  (+) | VG | Fruit: rate of change of skin color from maturity to over maturity | Fruit: taux de changement de couleur de l’épiderme de la maturité à la surmaturité | Frucht: Änderung der Farbe der Schale von der Reife bis zur Überreife | Fruto: tasa de cambio de color de la piel de la madurez a la sobremadurez |  |  |
| **QN** |  | absent or very slow | nul ou très lent | fehlend oder sehr langsam | ausente o muy lento | Clipper, Doral, Galia, Honey dew,  Piel de Sapo | 1 |
|  |  | slow | lent | langsam | lento | Goloso | 3 |
|  |  | medium | moyen | mittel | medio | Futuro, Vendôme Dulcinea | 5 |
|  |  | fast | rapide | schnell | rápido | Corin, Marina, Nembo | 7 |
| 53.  (+) | VG | Fruit: width of flesh in longitudinal section (at position of maximum fruit diameter) | Fruit: épaisseur maximale de la chair en section longitudinale (à la position du diamètre du fruit maximal) | Frucht: Maximale Breite des Fleisches im Längsschnitt (in der Position des maximalen Fruchtdurchmessers | Fruto: anchura máxima de la pulpa en sección longitudinal (en posición del diámetro del fruto máximo) |  |  |
| **QN** | **(d)** | thin | mince | dünn | delgada | Gama | 3 |
|  |  | medium | moyenne | mittel | media | Toledo | 5 |
|  |  | thick | épaisse | dick | gruesa | Tito | 7 |
| 54. (\*) | VG | Fruit: main color of flesh | Fruit: couleur principale de la chair | Frucht: Hauptfarbe des Fleisches | Fruto: color principal de la pulpa |  |  |
| **PQ** | **(d)** | white | blanche | weiß | blanco | Piel de Sapo | 1 |
|  |  | greenish white | blanche verdâtre | grünlichweiß | blanco verdoso | Galia | 2 |
|  |  | green | verte | grün | verde | Radical | 3 |
|  |  | yellowish white | blanche jaunâtre | gelblichweiß | blanco amarillento | Guaraní | 4 |
|  |  | orange | orange | orange | anaranjada | Védrantais | 5 |
|  |  | reddish orange | orange rougeâtre | rötlichorange | naranja rojizo | Magenta | 6 |
| 55. | VG | Only varieties with main color of flesh: orange: Fruit: intensity of orange color of flesh | Seulement les variétés à couleur principale de la chair: orange: Fruit: intensité de la couleur orange de la chair | Nur Sorten mit Hauptfarbe des Fleisches: orange: Frucht: Intensität der Orangefärbung des Fleisches | Únicamente variedades con color principal de la pulpa anaranjada: Fruto: intensidad del color anaranjado de la pulpa |  |  |
| **QN** | **(d)** | light | clair | hell | claro | Fantasy, Oloroso | 3 |
|  |  | medium | moyen | mittel | medio | Lunasol | 5 |
|  |  | dark | foncé | dunkel | oscuro | Geamar | 7 |
| 56. | VG | Only varieties with main color of flesh: white; greenish white; green; yellowish white: Fruit: secondary salmon coloring of flesh | Seulement les variétés à couleur principale de la chair: blanche; blanche verdâtre; verte; blanche jaunâtre: Fruit: coloration secondaire saumon de la chair | Nur Sorten mit Hauptfarbe des Fleisches: weiß; grünlichweiß; grün; gelblichweiß: Frucht: sekundäre Lachsfärbung des Fleisches | Únicamente variedades con color principal de la pulpa: blanco; blanco verdoso; verde; blanco amarillento: Fruto: coloración secundaria de la pulpa de color salmón |  |  |
| **QN** | **(d)** | absent or very weak | absente ou très faible | fehlend oder sehr gering | ausente o muy débil | Gustal | 1 |
|  |  | weak | faible | gering | débil | Floraprince, Toledo | 3 |
|  |  | medium | moyenne | mittel | media | Arizo, Eloro | 5 |
|  |  | strong | forte | stark | fuerte |  | 7 |
| 57.  (+) | VG | Fruit: firmness of flesh | Fruit: fermeté de la chair | Frucht: Festigkeit des Fleisches | Fruto: firmeza de la pulpa |  |  |
| **QN** | **(d)** | soft | molle | weich | blanda | Galia, Marina | 3 |
|  |  | medium | moyenne | mittel | media | Sancho, Supporter | 5 |
|  |  | firm | ferme | fest | firme | Braco, Geamar | 7 |
| 58. | VG | Only varieties with change of skin color from maturity to over maturity: Fruit at over maturity: hue of color of skin | Seulement les variétés à changement de couleur d’épiderme de la maturité à la surmaturité: Fruit à la surmaturité: teinte de couleur de l’épiderme | Nur Sorten mit Änderung der Farbe der Schale von der Reife bis zur Überreife: Frucht bei Überreife: Farbton der Schale | Únicamente variedades con cambio de color de la piel de la madurez a la sobremadurez: Fruto en la sobremadurez: tonalidad del color de la piel |  |  |
| **PQ** |  | yellow | jaune | gelb | amarillo | Futuro, Marina | 1 |
|  |  | orangish yellow | jaune orangé | hell orangegelb | amarillo anaranjado | Drake, Gama | 2 |
|  |  | creamish | crème | hell cremefarben | cremoso | Figaro, Vendôme | 3 |
| 59. | VG | Only varieties with change of skin color from maturity to over maturity and with yellow or orangish yellow color of skin: Fruit at over maturity: intensity of yellow color of skin | Seulement les variétés à changement de couleur de l’épiderme de la maturité à la surmaturité et avec une couleur d’épiderme jaune ou jaune orangé: Fruit à la surmaturité: intensité de la couleur jaune de l’épiderme | Nur Sorten mit Änderung der Farbe der Schale von der Reife bis zur Überreife und mit gelber oder hell orangegelber Farbe der Schale: Frucht bei Überreife: Intensität der Gelbfärbung der Schale | Únicamente variedades con cambio de color de la piel de la madurez a la sobremadurez y con el color de la piel amarillo o amarillo anaranjado: Fruto en la sobremadurez: intensidad del color amarillo de la piel |  |  |
| **QN** |  | light | clair | hell | claro | Dulcinea | 3 |
|  |  | medium | moyen | mittel | medio | Futuro | 5 |
|  |  | dark | foncé | dunkel | oscuro | Trapío | 7 |
| 60. (\*) | MS | Seed: length | Graine: longueur | Samen: Länge | Semilla: longitud |  |  |
| **QN** | **(e)** | very short | très courte | sehr kurz | muy corta | Geumssaraki, Golden Crispi | 1 |
|  |  | short | courte | kurz | corta | Elario, Katsura Giant | 3 |
|  |  | medium | moyenne | mittel | media | Arava, Sancho | 5 |
|  |  | long | longue | lang | larga | Amarillo Oro, Toledo | 7 |
|  |  | very long | très longue | sehr lang | muy larga | Albino | 9 |
| 61. | MS | Seed: width | Graine: largeur | Samen: Breite | Semilla: anchura |  |  |
| **QN** | **(e)** | very narrow | très étroite | sehr schmal | muy estrecha | Golden Crispi | 1 |
|  |  | narrow | étroite | schmal | estrecha | Aurabel | 3 |
|  |  | medium | moyenne | mittel | media | Arava, Sancho | 5 |
|  |  | broad | large | breit | amplia | Amarillo Oro | 7 |
|  |  | very broad | très large | sehr breit | muy amplia | Ronda | 9 |
| 62.  (+) | VG | Seed: shape | Graine: forme | Samen: Form | Semilla: forma |  |  |
| **QL** | **(e)** | not pine-nut shape | pas en forme de pigne de pin | nicht zirbelnußförmig | no apiñonada | Toledo | 1 |
|  |  | pine-nut shape | en forme de pigne de pin | zirbelnußförmig | apiñonada | Piel de Sapo | 2 |
| **63. (\*)** | **VG** | **Seed: color** | **Graine: couleur** | **Samen: Farbe** | **Semilla: color** |  |  |
| **QL** | **(e)** | whitish | blanchâtre | weißlich | blanquecino | Amarillo Oro s.b. | 1 |
|  |  | cream yellow | crème | cremefarben gelb | crema amarillento | Galia, Piel de Sapo | 2 |
| 64. | VG | Only varieties with cream yellow seed color: Seed: intensity of color | Seulement les variétés à couleur de graine crème: Graine: intensité de la couleur | Nur Sorten mit cremefarben gelben Samen: Samen: Intensität der Farbe | Únicamente variedades con el color de semilla crema amarillento: Semilla: intensidad del color |  |  |
| **QN** | **(e)** | light | claire | hell | clara | Goldgen | 3 |
|  |  | medium | moyenne | mittel | media | Galia | 5 |
|  |  | dark | foncée | dunkel | oscura | Doral | 7 |
| 65. | MG | Time of male flowering | Époque de floraison mâle | Zeitpunkt der männlichen Blüte | Época de floración masculina |  |  |
| **QN** |  | early | précoce | früh | temprana | Clipper, Vital | 3 |
|  |  | medium | moyenne | mittel | media | Categoría | 5 |
|  |  | late | tardive | spät | tardía | Nicolás, Rocín | 7 |
| 66. | MG | Time of female flowering | Époque de floraison femelle | Zeitpunkt der weiblichen Blüte | Época de floración femenina |  |  |
| **QN** |  | early | précoce | früh | temprana | Clipper | 3 |
|  |  | medium | moyenne | mittel | media | Braco, Categoría, Vital | 5 |
|  |  | late | tardive | spät | tardía | Nicolás | 7 |
| 67. | MG | Time of ripening | Époque de maturité | Zeitpunkt der Reife | Época de maduración |  |  |
| **QN** |  | very early | très précoce | sehr früh | muy temprana | Goldstar, Sun | 1 |
|  |  | early | précoce | früh | temprana | Galia | 3 |
|  |  | medium | moyenne | mittel | media | Védrantais | 5 |
|  |  | late | tardive | spät | tardía | Pinonet Piel de Sapo, Rochet | 7 |
|  |  | very late | très tardive | sehr spät | muy tardía | Clipper, Supporter, Tendral | 9 |
| 68. (\*) (+) | MG | Shelf life of fruit | Durée de conservation du fruit sur l’étalage | Haltbarkeitsdauer der Frucht | Conservación post cosecha del fruto |  |  |
| **QN** |  | very short | très courte | sehr kurz | muy breve | Charentais | 1 |
|  |  | short | courte | kurz | breve | Galia | 3 |
|  |  | medium | moyenne | mittel | media | Clipper | 5 |
|  |  | long | longue | lang | larga | Piel de Sapo | 7 |
|  |  | very long | très longue | sehr lang | muy larga | Tendral Negro | 9 |
| 69. | VG | Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom) | Résistance à *Fusarium oxysporum* f. sp. *melonis* (Fom) | Resistenz gegen *Fusarium oxysporum* f. sp. *melonis* (Fom) | Resistencia al *Fusarium oxysporum* f. sp. *melonis* (Fom) |  |  |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| 69.1   (+) |  | **Race 0 (Fom: 0)** | **Race 0 (Fom: 0)** | **Pathotyp 0 (Fom: 0)** | **Raza 0 (Fom: 0)** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Atos, Charentais T | 1 |
|  |  | present | présente | vorhanden | presente | Cadence,  Charentais Fom-2, Dibango, Jubilo, Karakal, Védrantais | 9 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| 69.2   (+) |  | Race 1 (Fom: 1) | Race 1 (Fom: 1) | Pathotyp 1 (Fom: 1) | Raza 1 (Fom: 1) |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Atos, Charentais T, Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | Cadence,  Charentais Fom-2, Dibango, Jubilo, Karakal | 9 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| 69.3   (+) |  | Race 2 (Fom: 2) | Race 2 (Fom: 2) | Pathotyp 2 (Fom: 2) | Raza 2 (Fom: 2) |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Atos,  Charentais Fom-2, Charentais T, Dibango, Marianna | 1 |
|  |  | present | présente | vorhanden | presente | Cadence, Charentais Fom-1, Jubilo, Karakal, Perlita, Védrantais | 9 |
| **69.4   (+)** | **VG** | **Resistance to *Fusarium oxysporum* f. sp. *melonis***  **Race 1.2 (Fom: 1.2)** | **Résistance à *Fusarium oxysporum* f. sp. *melonis***  **Race 1.2 (Fom: 1.2)** | **Resistenz gegen *Fusarium oxysporum* f. sp. *melonis*   Pathotyp 1.2  (Fom: 1.2)** | **Resistencia al *Fusarium oxysporum* f. sp. *melonis***  **Raza 1.2 (Fom: 1.2)** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Graffio, Prity, Virgos | 1 |
|  |  | present | présente | vorhanden | presente | Isabelle, Kyriel, Lunasol, Meliance, Piboule | 9 |
| 70. | VG | Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) | Résistance à *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (oïdium) | Resistenz gegen *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Echter Mehltau) | Resistencia a *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Oidio) |  |  |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **70.1  (+)** |  | **Race 1 (Px: 1)** | **Race 1 (Px: 1)** | **Pathotyp 1 (Px: 1)** | **Raza 1 (Px: 1)** |  |  |
| **QN** |  | absent or low | absente ou faible | fehlend oder gering | ausente o baja | Védrantais | 1 |
|  |  | medium | moyenne | mittel | media | Escrito | 2 |
|  |  | high | élevée | hoch | alta | Arum | 3 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **70.2  (+)** |  | **Race 2 (Px: 2)** | **Race 2 (Px: 2)** | **Pathotyp 2 (Px: 2)** | **Raza 2 (Px: 2)** |  |  |
| **QN** |  | absent or low | absente ou faible | fehlend oder gering | ausente o baja | Védrantais | 1 |
|  |  | medium | moyenne | mittel | media | Escrito, Pendragon | 2 |
|  |  | high | élevée | hoch | alta | Arum | 3 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **70.3  (+)** |  | **Race 3 (Px: 3)** | **Race 3 (Px: 3)** | **Pathotyp 3 (Px: 3)** | **Raza 3 (Px: 3)** |  |  |
| **QN** |  | absent or low | absente ou faible | fehlend oder gering | ausente o baja | Védrantais | 1 |
|  |  | medium | moyenne | mittel | media | Arago, Durango | 2 |
|  |  | high | élevée | hoch | alta | Arum | 3 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **70.4  (+)** |  | **Race 5 (Px: 5)** | **Race 5 (Px: 5)** | **Pathotyp 5 (Px: 5)** | **Raza 5 (Px: 5)** |  |  |
| **QN** |  | absent or low | absente ou faible | fehlend oder gering | ausente o baja | Védrantais | 1 |
|  |  | medium | moyenne | mittel | media | Arago, Durango | 2 |
|  |  | high | élevée | hoch | alta | Arum | 3 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **70.5  (+)** |  | **Race 3-5 (Px: 3.5)** | **Race 3-5 (Px: 3.5)** | **Pathotyp 3-5  (Px: 3.5)** | **Raza 3-5 (Px: 3.5)** |  |  |
| **QN** |  | absent or low | absente ou faible | fehlend oder gering | ausente o baja | Védrantais | 1 |
|  |  | medium | moyenne | mittel | media | Arago, Durango | 2 |
|  |  | high | élevée | hoch | alta | Arum | 3 |
| **71.  (+)** | **VG** | **Resistance to *Golovinomyces cichoracearum*  *(Erysiphe cichoracearum)*  Race 1 (Powdery mildew)** | **Résistance à *Golovinomyces cichoracearum*  *(Erysiphe cichoracearum)* Race 1 (oïdium)** | **Resistenz gegen *Golovinomyces cichoracearum*  *(Erysiphe cichoracearum* Pathotyp 1 (Echter Mehltau)** | **Resistencia a *Golovinomyces cichoracearum*  *(Erysiphe cichoracearum)* Raza 1 (Oidio)** |  |  |
| **QN** |  | susceptible | sensible | anfällig | susceptible | Escrito, Score, Védrantais | 1 |
|  |  | moderately resistant | moyennement résistant | mäßig resistent | moderadamente resistente | Flores, Anasta | 2 |
|  |  | highly resistant | hautement résistant | hochresistent | altamente resistente | Cézanne, Heliobel, Théo | 3 |
| 72.  (+) | VG | Resistance to colonization by *Aphis gossypii* | Résistance à la colonisation par *Aphis gossypii* | Resistenz gegen Befall durch *Aphis gossypii* | Resistencia a la colonización por *Aphis gossypii* |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | AR Hale’s Best Jumbo,  AR Top Mark, Godiva, Heliobel, Virgos | 9 |
| 73.  (+) | VG | Resistance to *Zucchini yellow mosaic virus* (ZYMV) | Résistance au virus de la mosaïque jaune de la courgette (ZYMV) | Resistenz gegen Zucchinigelb-mosaikvirus (ZYMV) | Resistencia al virus del mosaico amarillo del calabacín (ZYMV) |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Cardillo, Généris, Jador, Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | Hannah’s Choice, Lunaduke | 9 |
| **74.** | **VG** | **Resistance to *Papaya ringspot virus* (PRSV)** | **Résistance au virus des taches annulaires du papayer (PRSV)** | **Resistenz gegen Papayaringflecken-virus (PRSV)** | **Resistencia al virus de la mancha anular del papayo (PRSV)** |  |  |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **74.1  (+)** |  | **Guadeloupe strain** | **Souche Guadeloupe** | **Pathotyp Guadeloupe** | **Cepa Guadeloupe** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | Hannah’s Choice | 9 |
|  |  | ------------------------ | -------------------------- | -------------------------- | ------------------------ | --------------------------- | ------- |
| **74.2  (+)** |  | **E2 strain** | **Souche E2** | **Pathotyp E2** | **Cepa E2** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Hannah’s Choice, Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | WMR29 | 9 |
| 75.  (+) | VG | **Resistance to *Melon necrotic spot virus* (MNSV) Strain 0 (MNSV: 0)** | **Résistance au virus de la criblure du melon (MNSV) Souche 0 (MNSV: 0)** | **Resistenz gegen Netzmelonen-nekrosefleckenvirus (MNSV) Pathotyp 0 (MNSV: 0)** | **Resistencia al virus del cribado del melón (MNSV) Cepa 0 (MNSV: 0)** |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Védrantais | 1 |
|  |  | present | présente | vorhanden | presente | Cyro, Primal, Virgos, Yellow Fun | 9 |
| 76.  (+) | VG | Resistance to *Cucumber mosaic virus* (CMV) | Résistance au virus de la mosaïque du concombre (CMV) | Resistenz gegen Gurkenmosaikvirus (CMV) | Resistencia al virus del mosaico del pepino (CMV) |  |  |
| **QL** |  | absent | absente | fehlend | ausente | Cézanne, Dalton | 1 |
|  |  | present | présente | vorhanden | presente | Lunaduke, Virgos | 9 |

# Explanations on the Table of Characteristics

## 8.1 Explanations covering several characteristics

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

(a) Seedling: All observations on the seedling should be made just before the development of the first true leaf.

(b) Leaf blade: Unless otherwise indicated,all observations on the leaf blade, should be made on fully developed but not old leaves, preferably between the 5thand 8th node when the plant has at least 11 nodes.

(c) Young fruit: All observations on the young fruit should be made on green, unripe fruits, before the color change. For most varieties this means when the fruit is half the final size. To facilitate the observation, it is recommended to harvest one young fruit per plant, if the number of fruits per plant makes that possible.

(d) Fruit: Observations which should be made on ripened fruit. The color must not start to change to the over maturity color. When appropriate, for the flesh characteristics it is recommended to wait at least one week after the harvest before opening the fruits.

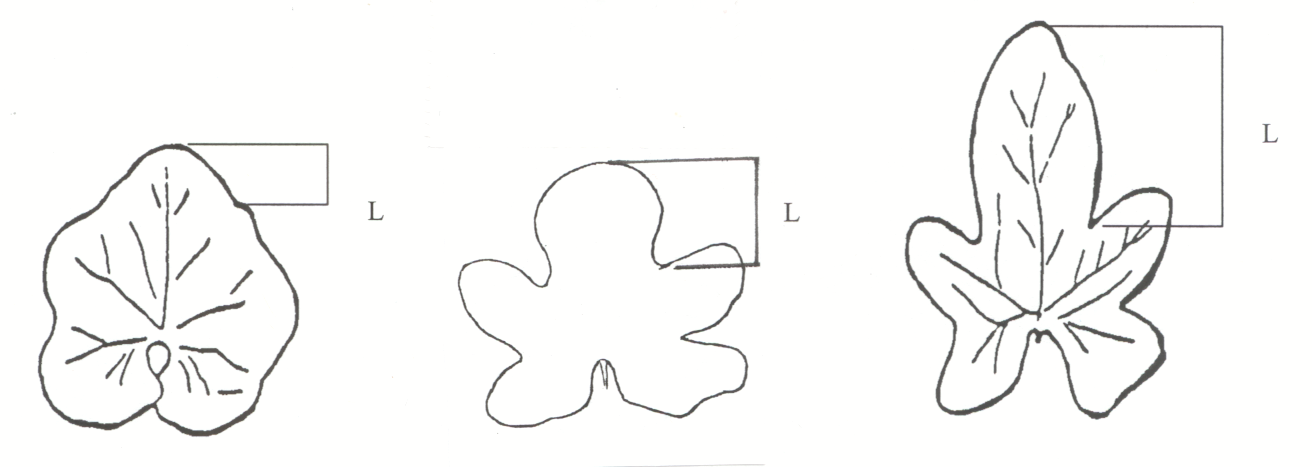
(e) Seed: All observations on the seed should be made on fully developed and dry seeds, after washing and drying in the shade.

## 8.2 Explanations for individual characteristics

Ad. 6: Leaf blade: development of lobes

|  |  |  |
| --- | --- | --- |
|  | | |
| 3  weak | 5  medium | 7  strong |

Ad. 7: Leaf blade: length of terminal lobe



|  |  |  |
| --- | --- | --- |
| 3  short | 5  medium | 7  long |

Ad. 13: Young fruit: hue of green color of skin

The basic color of the young fruit is green. There are two true hue levels “yellowish” and “green” depending on the proportion between red and blue components in the color, and two other hue levels “greyish” that is rather a low saturation of the green color and “whitish” that results from a very light intensity of the green color.

Ad. 23: Fruit: change of skin color from young fruit to maturity

Ad. 52: Fruit: Rate of change of skin color from maturity to over maturity

The melon fruit may have up to three different skin colors in the course of its development. The speed of evolution of the color depends on the type of variety, but within a type different speeds can also be observed. Please note that in cases where the color change is closely linked to maturity, the observation should be clear: either on the color change related to maturity (characteristic 23) or within mature fruits from mature to over mature (characteristic 53). The changing of fruit skin color can be described by using the following characteristics:

1. Stage 1: color of the young fruit (green color)

2. Change from Stage 1 to Stage 2 (Characteristics 23)

3. Stage 2: color at maturity

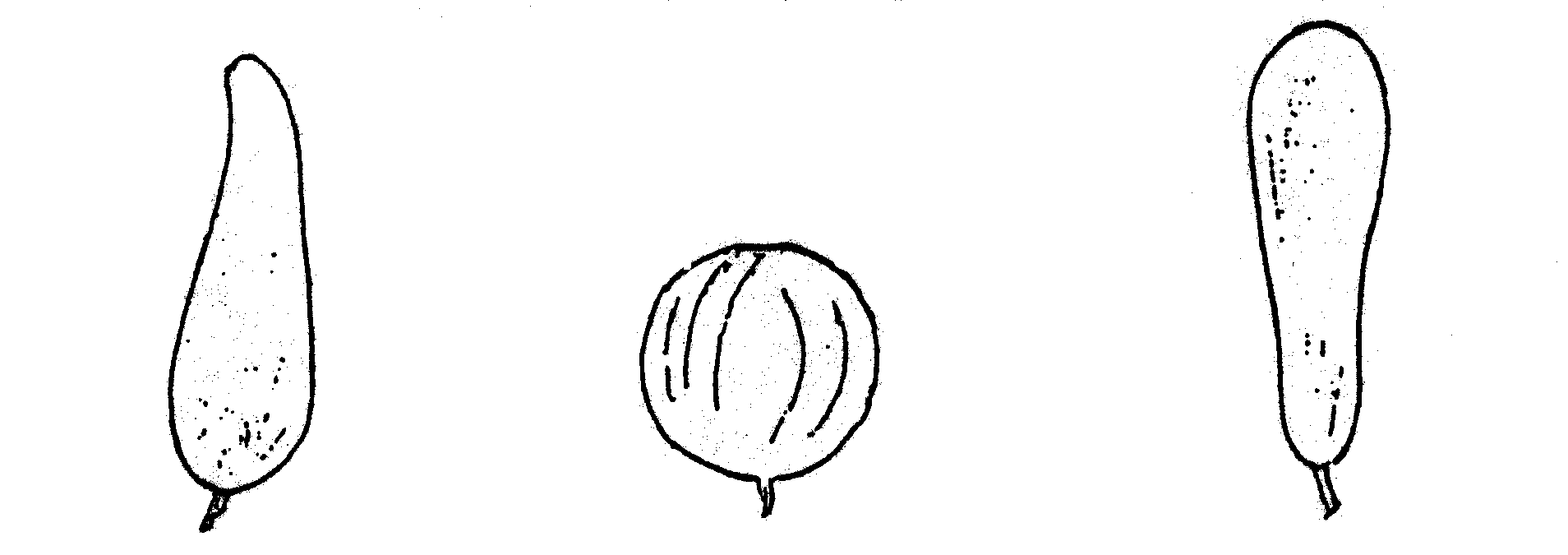
4. Change from Stage 2 to Stage 3 (Characteristic 53)

5. Stage 3: color at over maturity.

Some examples are given in the following table:

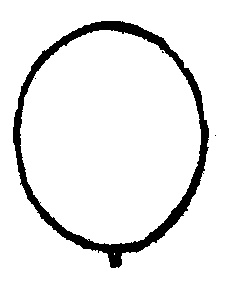
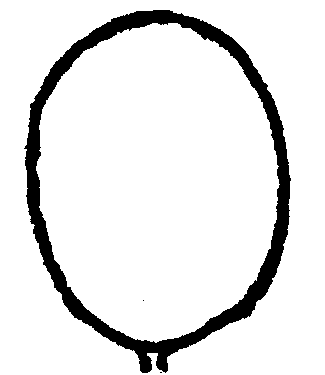
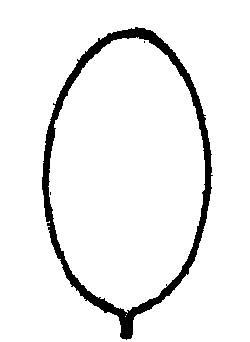
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variety | Stage 1:  color of the young fruit | Change from Stage 1 to Stage 2 (Ch. 23) | Stage 2: color at maturity (Ch. 29) | Change from Stage 2 to Stage 3  (Ch. 53) | Stage 3:  color at over maturity |
| Galia | green | late | yellow | absent | yellow |
| Amarillo Oro | green | late | yellow | absent | yellow |
| Doral | green | late | yellow | absent | yellow |
| Charentais | green | early | grey | fast | yellow |
| Alpha | green | early | grey | medium | yellow |
| Clipper | green | early | grey | absent | grey |
| Vendome | green | early | grey | medium | yellow |
| Corin | green | early | grey | fast | yellow |
| Nembo | green | early | grey | fast | yellow |
| Albino | green | late | white | absent | white |
| Honey Dew | green | late | white | absent | white |
| Dulcinea | green | late | white | medium | yellow |
| Marina | green | no-change | green | fast | yellow |
| Futuro | green | no change | green | medium | yellow |
| Goloso | green | no change | green | slow | yellow |
| Piel de Sapo | green | no change | green | absent | green |

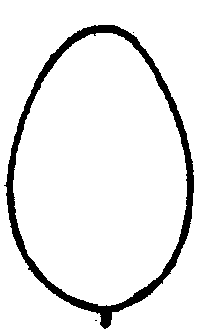
Ad. 27: Fruit: position of maximum diameter



|  |  |  |
| --- | --- | --- |
| 1  toward stem end | 2  at middle | 3  toward blossom end |

Ad. 28: Fruit: shape in longitudinal section





|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2 | 3 | 4 |
| ovate | medium elliptic | broad elliptic | circular |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 5  quadrangular | 6  oblate | 7  obovate | 8  elongated |

Ad. 29: Fruit: ground color of skin

Ad. 31: Fruit: hue of ground color of skin

For example:

All the Galia type would be considered as yellow color. Hues ochre, orange, pure yellow or greenish can be considered in the group, but in a separate characteristic (31).

All the Charentais type would be considered as grey. Greenish, whitish, or yellowish hues (characteristic 31) can be used for distinctness, but are not recommended for grouping.

Ochre is pale brownish yellow.

The colors given below indicate the ground color of skin of the variety in question.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Hue of ground color  (characteristic 31) | |
| Example variety | Ground color (characteristic 29) | State | Note |
| Amarillo-Canario | yellow | absent or very weak | 1 |
| Albino | white | absent or very weak | 1 |
| Piel de Sapo | green | absent or very weak | 1 |
| Sirio | grey | absent or very weak | 1 |
| Romeo | grey | whitish | 2 |
| Geaprince | grey | yellowish | 3 |
| Supporter | grey | yellowish | 3 |
| Edén | yellow | orange | 4 |
| Passport | yellow | ocre | 5 |
| Geamar | grey | greenish | 6 |
| Honey Dew | white | greenish | 6 |
| Solarking | yellow | greenish | 6 |
| Gohyang | green | greyish | 7 |

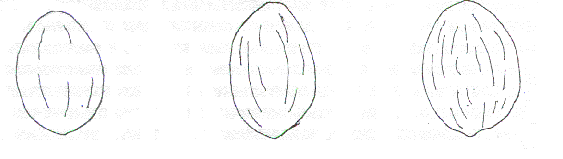
Ad. 40: Fruit: shape of base

|  |  |  |
| --- | --- | --- |
|  | | |
| 1  pointed | 2  rounded | 3  truncate |

Ad. 41: Fruit shape of apex

|  |  |  |
| --- | --- | --- |
|  | | |
| 1  pointed | 2  rounded | 3  truncate |

Ad. 47: Fruit: creasing of surface

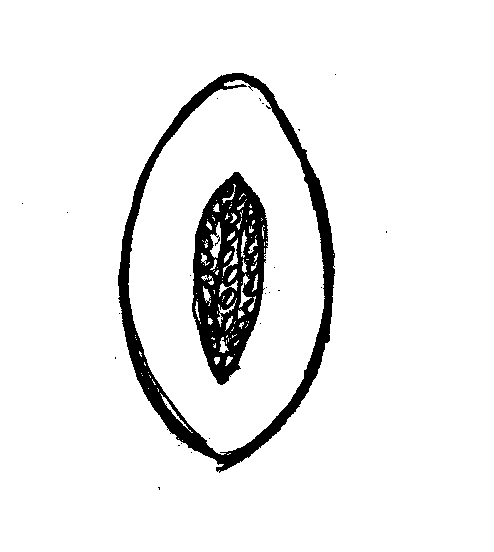


|  |  |  |
| --- | --- | --- |
| 3  weak | 5  medium | 7  strong |

Ad. 52: Fruit: Rate of change of skin color from maturity to over maturity

See Ad. 23, Ad. 52

Ad. 53: Fruit: width of flesh in longitudinal section (at position of maximum fruit diameter)



Ad. 57: Firmness of flesh

Firmness of the flesh should be assessed in the central third of the fruit. The assement can be made by pressing the flesh with the blunt end of a pencil, or similar instrument, midway between the skin and the mucilage.

Ad. 62: Seed: shape

|  |  |  |
| --- | --- | --- |
| (b)  (a) | general shape | (b)    (a) |
|  | (a) cross section |  |
|  | (b) longitudinal section |  |
| 1 |  | 2 |
| not pine-nut shape |  | pine-nut shape |

Pine-nut shape seed (Piñonet) is controlled by a recessive characteristic with simple genetic regulation. Seed with pine-nut shape resembles the shape of a pine nut and has the following features:

the hilum end is slightly more pointed, with very small wings;

the apical end has a tendency to be more rounded;

in cross section the seed has a tendency to be more symmetrically elliptical;

the surface is not covered with arista.

Ad. 68: Shelf life of fruit

Shelf life is the time that the fruit remains firm in storage.

Five fruits per plot are stored in boxes in single layers. The boxes can be stored one on top on another if air can circulate between them. The storage area does not need to be climatically controlled, but must have naturally good conditions for storing fruits.

Observations are made at regular intervals of 3 to 4 days, noting the firmness of fruits, taking care not to damage them, and removing those which are damaged or rotten. The observation is to determine when the fruits become soft, i.e. when the firmness of the fruit becomes equal or lower than Note 3 “soft” in characteristic 57.

Ads. 69.1 - 69.3: Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom)*,* races 0, 1 and 2 (Fom: 0, Fom: 1, Fom: 2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. | | Pathogen | | | | *Fusarium oxysporum* f. sp. *melonis* races 0, 1, and 2 |
| 2. | | Quarantine status | | | | No |
| 3. | | Host species | | | | Melon - *Cucumis melo* |
| 4. | | Source of inoculum | | | | e.g. GEVES (FR)[[2]](#footnote-2) |
| 5. | | Isolate | | | | e.g., Reference strain validated in an inter-laboratory test[[3]](#footnote-3), [[4]](#footnote-4)  Fom:0   * Strain MLZ   = MAT/REF/04-07-01-03-02 1  Fom: 1   * Strain FOM 26   = MAT/REF/04-07-01-01 1  Fom: 2   * Strain F185 |
| 6. | | Establishment isolate identity | | | | The most recent table is available through ISF at  <https://www.worldseed.org/our-work/plant-health/differential-hosts/>  *Situation July 2019* |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Differential host** | **Gene present** | **Fom: 0\*** | **Fom: 1\*** | **Fom: 2\*** | **Fom: 1.2\*** | | Charantais T\* | - | S | S | S | S | | Védrantais\*, Doublon\* | *Fom-1* | HR | S | HR | S | | Charantais Fom-2\*, CM17187\* | *Fom-2* | HR | HR | S | S | | Isabelle\* | *Polygenic?* | HR | HR | HR | IR |   S = susceptible; HR = highly resistant; IR = intermediate  \*differential hosts and isolates that are used by the seed sector  Courtesy of Worldseed.org website | | | | | | |
| 7. | Establishment pathogenicity | | | | use susceptible melon varieties | |
| 8. | Multiplication inoculum | | | |  | |
| 8.1 | Multiplication medium | | | | on agar medium – e.g., Potato Dextrose Agar, Malt agar at 20°C to 25°C | |
| 8.2 | Multiplication variety | | | | - | |
| 8.3 | Plant stage at inoculation | | | | - | |
| 8.5 | Inoculation method | | | | - | |
| 8.6 | Harvest of inoculum | | | | 7–10-day-old culture | |
| 8.7 | Check of harvested inoculum | | | | - | |
| 8.8 | Shelf life /viability inoculum | | | | Between 4 to 8 hours or keep cool to prevent spore germination | |
| 9. | Format of the test | | | |  | |
| 9.1 | Number of plants per genotype | | | | at least 30 plants, it is important to have at least 5 non-inoculated plants per variety to be able to assess the growth reduction | |
| 9.2 | Number of replicates | | | | At least e.g. 3 replicates (3 x10) | |
| 9.3 | | | Control varieties |  | | |
| 9.3.1 | | | Control varieties for race 0 | Resistance absent: Charentais T  Resistance present: Charentais Fom-2, Védrantais | | |
| 9.3.2 | | | Control varieties for race 1 | Resistance absent: Charentais T, Védrantais  Resistance present: Charentais Fom-2 | | |
| 9.3.3 | | | Control varieties race 2 | Resistance absent: Marianna  Resistance present: Perlita, Charentais Fom-1, Védrantais | | |
| 9.4 | | | Test design | 3 replicates of 10 plants to allow statistical analysis (in different trays) and at least 5 non-inoculated plants per variety. | | |
| 9.5 | | | Test facility | glasshouse or climatic room | | |
| 9.6 | | | Temperature | - Fom: 0 and Fom: 1: 18 - 24°C  - Fom: 2: 24°C | | |
| 9.7 | | | Light | - Fom: 0 and Fom: 1: At least 12h  - Fom: 2: 16h | | |
| 9.9 | | | Special measures | - Fom: 0 and Fom: 1: Recommended temperatures 18°C at night and not above 24°C during the day. | | |
| 10. | | | Inoculation |  | | |
| 10.1 | | | Preparation inoculum | Scrape spore cultures with water from agar medium (see 8.1) or optional multiplication on liquid medium (e.g., Messiaen (1991) synthetic liquid medium, sucrose 50g/L, on permanent agitator-shaker or aerated Czapek-Dox culture medium for 5-7 days at room temperature).  *Remark*: Beware of toxin productions by some isolates (see remark under 13.) | | |
| 10.2 | | | Quantification inoculum | 4x105 to 1x106 sp /mL | | |
| 10.3 | | | Plant stage at inoculation | cotyledon expanded | | |
| 10.4 | | | Inoculation method | Plant at the inoculation stage are harvested carefully, roots and hypocotyls are immersed in spore suspension for 2-15 min; trimming of roots is an option; transplant in trays. | | |
| 10.5 | | | First observation | 1st notation: symptoms on Resistance absent (susceptible) control at classes 2 and 3 with a strong proportion at class 3 | | |
| 10.6 | | | Second observation | A second notation can be necessary to re-evaluate some unclear varieties | | |
| 11. | | | Observations |  | | |
| 11.1 | | | Method | Visual observation | | |

|  |  |  |
| --- | --- | --- |
| 11.2 | Observation scale |  |

|  |  |  |
| --- | --- | --- |
| non-inoculated plant  = mock | Class 0 | Class 1 |
| At least 5 plants | Healthy plant: no symptoms of yellowing and wilting. Slight growth reduction may occur due to inoculation stress. Yellowing different from *Fusarium* symptoms may sometimes occur in non-inoculated plants. | Light symptoms of yellowing/wilting |
|  | | |

|  |  |  |
| --- | --- | --- |
| Class 2 | Class 3 |  |
| typical symptoms: yellowing, wilting and necrosis, stunting (growth stopped) | Death of plant (Dead) |  |
|  | | Vein clearing symptoms may be observed due to other factors. Their evolution over time should be assessed. |

Courtesy of GEVES-SNES in the framework of CPVO Harmores project.

|  |  |  |
| --- | --- | --- |
| 11.3 | Validation of test | Validation on controls.  In case of the Fom: 0 and Fom:1 tests:  Controls expected response:  Resistance absent: most of the plants at classes 2 and 3  Resistance present: most of the plants at classes 0 and 1, sometimes very few plants at classes 2 or 3.  In case of the Fom: 2 test  Controls expected response:   * Susceptible controls, with UPOV characteristic state ‘Resistance absent’, should have most of the plants in observation classes 2 or 3, and few or no plants in observation classes 0 or 1.   + Marianna, the susceptible control is less susceptible than Charentais Fom‑2, Charentais T * Resistant controls should have most of the plants in observation classes 0 or 1, and few or no plant in observation classes 2 or 3.   Perlita, the lower threshold resistance control, should have at least some plants in observation class 1, 2, or 3. It has to be less resistant than Charentais Fom-1, Védrantais. |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | For varieties with a response between the susceptible (resistance absent) and the resistant control, repeat the test.  In case of confirmation of the result, the variety will be judged heterogeneous.  In case of an inconclusive results, retest or test in another lab. |
| 13. | Critical control points | For race 2, the control Perlita, with the *Fom-3* gene, allows to validate the capacity of the isolate to partially attack this variety.  In the case of inoculum increased in e.g. Messiaen (1991) synthetic liquid medium, on permanent agitator-shaker, inoculum can be used after 5 to 7 days.  For race 0 and 1, dilution 1/12 is recommended, while it must not be less than 1/20 for race 2. At a lower dilution (higher concentration of the medium), it has been observed that toxins released in the medium by the race 2 can cause some yellowing of melon plants, even if they are resistant. Alternatively, spores can be “washed” by resuspending a mass of spores collected on a Millipore filter with vacuum force. |

Ad. 69.4: Resistance to *Fusarium oxysporum* f. sp. *melonis,* race 1.2 (Fom: 1.2)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Fusarium oxysporum* f. sp. *melonis* race 1.2 (Fom: 1.2) |
| 2. | Quarantine status | No |
| 3. | Host species | Melon - *Cucumis melo* L. |
| 4. | Source of inoculum | GEVES (FR)[[5]](#footnote-5) |
| 5. | Isolate | e.g., Reference strain validated in an inter-laboratory test[[6]](#footnote-6)  Fom: 1.2   * Strain TST   = MAT/REF/04-07-01-04 2 |
| 6. | Establishment isolate identity | The most recent table is available through ISF at  <https://www.worldseed.org/our-work/plant-health/differential-hosts/>  *Situation July 2019* |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Differential host** | **Gene present** | **Fom: 0\*** | **Fom: 1\*** | **Fom: 2\*** | **Fom: 1.2\*** | | Charantais T\* | - | S | S | S | S | | Védrantais\*, Doublon\* | *Fom-1* | HR | S | HR | S | | Charantais Fom-2\*, CM17187\* | *Fom-2* | HR | HR | S | S | | Isabelle\* | *Polygenic?* | HR | HR | HR | IR |   S = susceptible; HR = highly resistant; IR = intermediate  \*differential hosts and isolates that are used by the seed sector  Courtesy of Worldseed.org website | | |
| 7. | Establishment pathogenicity | use susceptible melon varieties |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | on agar medium e.g., Potato Dextrose Agar, Sabouraud, at 20°C to 25°C |
| 8.2 | Multiplication variety | - |
| 8.3 | Plant stage at inoculation | - |
| 8.5 | Inoculation method | - |
| 8.6 | Harvest of inoculum | 4-10 day-old culture |
| 8.7 | Check of harvested inoculum | - |
| 8.8 | Shelf life/viability inoculum | - |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | 30 plants per variety plus 5 non-inoculated controls |
| 9.2 | Number of replicates | At least 3 x 10 plants, in different trays |
| 9.3 | Control varieties | Resistance absent: Virgos  Resistance present: Piboule and Lunasol and Isabelle (Isabelle is expected to have a lower disease index (DI) (= higher resistance than Piboule and Lunasol).  Piboule and Lunasol are both needed to illustrate the lower level of resistance. Their resistance is based on other genetics and may have different levels in different labs. |
| 9.4 | Test design | 3 replicates of 10 plants to allow statistical analysis (in different trays) and at least 5 non-inoculated plants per variety. |
| 9.5 | Test facility | glasshouse or climatic room |
| 9.6 | Temperature | 18-24°C |
| 9.7 | Light | at least 12h |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | Scrape cultures with water on agar medium (see 8.1) or optional multiplication on liquid medium (e.g., Potato Dextrose Broth (PDB), Czapek-Dox culture medium for 7 days at room temperature and darkness or Messiaen (1991) synthetic liquid medium, sucrose 50 g/L, on permanent agitator-shaker, at room-temperature, inoculum can be used after 5 to 7 days) |
| 10.2 | Quantification inoculum | 1x105-1x106 sp/mL, depending on inoculation method (see 10.4) and lab conditions |
| 10.3 | Plant stage at inoculation | cotyledons expanded, first leaf emerging |
| 10.4 | Inoculation method | One of two methods can be used for inoculation.   * Absorption:   Absorption of a suspension of spores, e.g., 700mL of a suspension at 1.105 sp/mL for 50 plants in a tray 30 cm\*30 cm.   * Injection:   Injection of a suspension of spores into the soil at the base of the plant, e.g., 5mL at 106 sp /mL per plant. |
| 10.7 | Final observations | 1st notation: symptoms on susceptible control at least at class 3 [generally 10-21 dpi]. A 2nd notation can be necessary to reevaluate some unclear varieties. |
| 11. | Observations |  |
| 11.1 | Method | Visual observation |
| 11.2 | Observation scale |  |

|  |  |  |
| --- | --- | --- |
| Non-inoculated plants = mock | Class 0 | Class 1 |
| Varieties must be compared to the non-inoculated plants. | Healthy plant, the whole plant is green or at the same level than the mock. Just a light yellowing can be accepted on the mock | Light level of symptoms, light yellowing on cotyledons and/or leaves without necrosis |
|  | | |

|  |  |  |
| --- | --- | --- |
| Class 2 | Class 3 | Class 4 |
| Moderate level of symptoms, yellowing on cotyledon and/or leaves, starting of necrosis and wilting but not extended | Severe symptoms of yellowing and/or wilting on cotyledons and/or leaves with extended necrosis | Dead plant, no green leaf part or hypocotyl is dry |
|  | | |

Courtesy of GEVES-SNES in the framework of CPVO Harmores project.

|  |  |  |
| --- | --- | --- |
| 11.3 | Validation of test | Validation on controls. Controls expected response:   * Resistance present:   Most plants in classes 0 and 1, in some cases with few plants in 2, 3, 4.  Low level of disease index (DI) generally below 40%. A difference of disease index is generally observed between Piboule and Lunasol compared to Isabelle   * Resistance absent:   Most plants in classes 3 and 4, in some cases with few plants at class 0, 1, or 2. Very high disease index (DI) above 80%. |
| 11.4 | Off-types | ~~-~~ |
| 12. | Interpretation of data in terms of UPOV characteristic states | Interpretation of varieties depending on controls (figure 1)  Note 1 = Resistance absent  Note 9 = Resistance present  Quantitative analysis is based on the disease index (DI) AND the distribution of plants per class compared to the controls  The varieties statistically similar to the resistant controls or with a lower disease index (DI) have to be judged as resistant.  The varieties between the susceptible and the resistant controls have to be judged as susceptible.  If not clear, the use of statistics is highly recommended. |
| Resistance to Fom:1-2:  Nx : number of plants at class x  *Figure 1: disease index (DI) formula* | | |

Ads. 70.1 to 70.5: Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea*) (Powdery mildew)races 1, 2, 3, 5, 3.5 (Px: 1, 2, 3, 5, 3.5)

Ad. 71: Resistance to *Golovinomyces cichoracearum (Erysiphe cichoracearum),* race 1 (Powdery mildew)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | Powdery mildew:*Podosphaera xanthii* (ex *Sphaerotheca fuliginea*) races 1, 2, 3, 5 and 3.5  *Golovinomyces cichoracearum* (ex *Erysiphe cichoracearum*) race 1 |
| 2. | Quarantine status | No |
| 3. | Host species | Melon - *Cucumis melo* L. |
| 4. | Source of inoculum | GEVES (FR)[[7]](#footnote-7) |
| 5. | Isolate | e.g., Reference strain validated in an inter-laboratory test[[8]](#footnote-8)  Px: 1   * Strain Sm 3   = MAT/REF/04-07-03-01 6  Px: 2   * Strain S87-7   = MAT/REF/04-07-03-02 7  Px: 3   * Strain 00Sm39   = MAT/REF/04-07-03-04-02 7  Px: 5   * Strain 98Sm65   = MAT/REF/04-07-03-03-01-02 7  Px: 3.5   * Strain 04Sm2   = MAT/REF/04-07-03-05-01 7  Gc: 1   * Strain GEVES   = MAT/REF/04-07-02-01)[3](mailto:contact@geves.fr) |
| 6. | Establishment isolate identity | on differentials (table 1) |

Table 1:

Races of *Podosphaera xanthii* (Px) and *Golovinomyces cichoracearum* (Gc), J. McCreight and M. Pitrat

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | *Podosphaera xanthii* | | | | | | *Golovinomyces cichoracearum* | |
|  | Race 0 | Race 1 | Race 2 | Race 3 | Race 4 | Race 5 | Race 3.5 | Race 0 | Race 1 |
| Iran H | S | S | S | S | S | S | S | S | S |
| Védrantais | R | S | S | S | S | S | S | R | S |
| PMR45 | R | R | S | S | S | S | S | R | S |
| WMR29 | R | R | R | R | S | S | S | R | S |
| Edisto 47 | R | R | R | R | R | S | S | R | S |
| MR-1, PI124112 | R | R | R | R | R | R | R | R | R |
| PMR5 | R | R | R | S | S | R | S | R | R |
| Nantais Oblong | R | S | S | S | S | S | S | R | R |

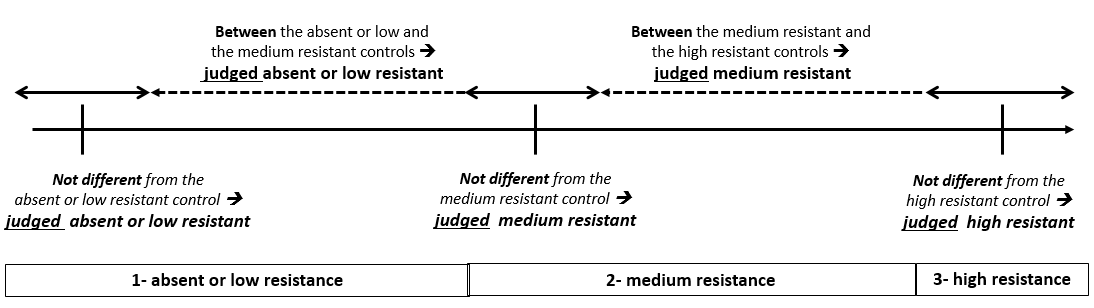
|  |  |  |  |
| --- | --- | --- | --- |
| 7. | | Establishment pathogenicity | use susceptible melon varieties |
|  | |  |  |
| 8. | | Multiplication inoculum |  |
| 8.1 | | Multiplication medium | Melon plantlets |
| 8.2 | | Multiplication variety | Susceptible variety, for example Védrantais.  For higher isolates like 3.5 or 5, a variety with defeated resistance may be preferable to keep the isolate fit. |
| 8.3 | | Plant stage at inoculation | Cotyledon |
| 8.5 | | Inoculation method | Sowing in substrate, for example soil or disinfected peat inside a closed mini glasshouse. When the cotyledons have expanded, remove them from the plant. Disinfect the cotyledons by soaking them for 3 minutes in a mercuric chloride solution (0.05%) or in sodium hypochlorite solution. Rinse them with sterilized water. Dry the cotyledons with sterile paper towel, then place them in Petri dishes with the following medium:  Sucrose 10g  Mannitol 20g  Agar 5g  Distilled water 1 liter  Scatter conidia on the cotyledons and blow them or deposit conidia at the surface of cotyledons. Incubate the inoculated cotyledons in Petri dishes for example at 23°C during 14 hours in the light and at 18°C during 10 hours in the dark or 17°C permanently under very low light intensity. 9 to 11 days after the inoculation, the cotyledons will be covered with conidia and can be used as an inoculum. |
| 8.6 | | Harvest of inoculum | Sporulation on cotyledons |
| 8.8 | | Shelf life /viability inoculum | Maximum 1 to 1.5 months after the inoculation. |
| 9. | | Format of the test |  |
| 9.1 | | Number of plants per genotype | At least 20 plants per variety and controls, 5 plants for other differentials to validate the identity of the Px race tested. |
| 9.2 | | Number of replicates | - |
| 9.3 | | Control varieties |  |
|  |  | | For *Podosphaera xanthii* (Px) race 1, resistance   * absent or low: Védrantais * medium: Escrito * high: Arum   For *Podosphaera xanthii* (Px) race 2, resistance:   * absent or low: Védrantais * medium: Escrito, Pendragon * high: Arum   For *Podosphaera xanthii* (Px) races 3, 5, 3.5, resistance:   * absent or low: Védrantais * medium: Arago, Durango * high: Arum   For *Golovinomyces cichoracearum* (Gc) race 1, resistance:   * absent or low: Védrantais * medium: Anasta * high: Cézanne | |
| 9.4 | Test design | | Include at least 5 plants per differential to validate the race and compare the level of sporulation. | |
| 9.5 | Test facility | | Climatic chamber or greenhouse | |
| 9.6 | Temperature | | 20-24°C | |
| 9.7 | Light | | At least 12 hours | |
| 10. | Inoculation | |  | |
| 10.1 | Preparation inoculum | | - | |
| 10.2 | Quantification inoculum | | - | |
| 10.3 | Plant stage at inoculation | | Whole plants at 3-4 true leaf fully expanded stage. Inoculation on the leaves 2 and 3 indicated on the diagram below.    Courtesy of GEVES-SNES in the framework of CPVO Harmores project. | |
| 10.4 | Inoculation method | | Take spores from a cotyledon already covered with conidia and deposit them on a leaf. Different isolates can be tested on the same plant (or the same leaf) if the local deposit is well separated from each other and if a mark indicates the place of the deposit. | |
| 10.7 | Final observations | | The date of notation should be chosen based on expected symptoms on the three controls. Sporulation should be well expressed on the susceptible control. | |
| 11. | Observations | |  | |
| 11.1 | Method | | Visual observation of sporulation | |
| 11.2 | Observation scale | |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| Class 1: No development of the fungus (no mycelium or dead mycelium) or no sporulation | Class 3: weak sporulation | Class 5: moderate sporulation | Class 9: strong sporulation |
| Example of contamination by environment on the susceptible control, test not validated | | | | |

Courtesy of GEVES-SNES in the framework of CPVO Harmores project.

|  |  |  |
| --- | --- | --- |
| 11.3 | Validation of test | Validation on controls.  Additional information for expected responses of *Podosphaera xanthii* controls  Resistance absent or low   * Plants at class 9, or most of the plants at class 9 and few plants at class 5 (high disease index). * Few plants at class 3 but in this case the resistant controls should be all at class 1 and the intermediate resistant control at classes 3 and 1. * No plants at class 1.   Resistance medium   * Between the resistant and the susceptible control. * Generally, plants at classes 3 and 5.   Resistance hiqh   * Plants at class 1, or most of the plants at class 1 and few plants at class 3 (very low disease index). * Plants at class 3 but in this case the susceptible control should be all at class 9. * No plants at classes 5 or 9. |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | Interpretation of varieties depending on controls (figure 1)  Resistance  Note 1 = absent or low  Note 2 = medium  Note 3 = high  Quantitative analysis is based on the disease index AND the distribution of plants per class compared to the controls.  Additional information for *Podosphaera xanthii* controls:  The varieties between the intermediate resistant and the resistant control have to be judged as intermediate resistant (because they are not resistant enough to be considered resistant).  The varieties between the susceptible and the intermediate resistant control have to be judged as susceptible (because they are not resistant enough to be considered intermediate resistant). |

Resistance to Px:



**3 – high resistance**

**2 – medium resistance**

**1 – absent or low resistance**

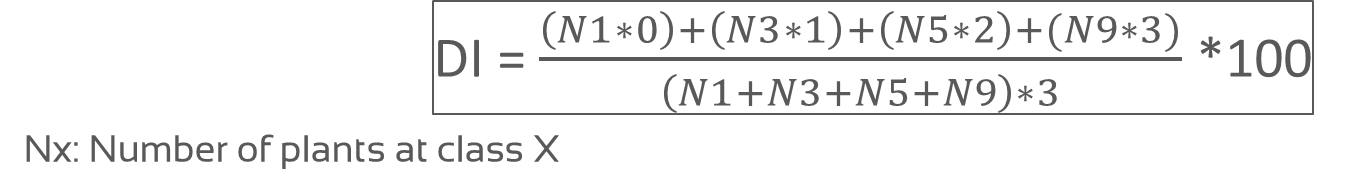
***Not different*** *from the   
high resistant control 🡪****high resistance***

***Not different*** *from the   
absent or low resistant control 🡪****absent or low resistance***

***Not different*** *from the   
medium resistant control 🡪****medium resistance***

**Between** the absent or low and the medium resistant controls 🡪   
**absent or low resistance**

**Between** the medium resistant and high resistant controls 🡪   
**medium resistance**



NX: Number of plants at class X

Figure 1: disease index formula

|  |  |  |
| --- | --- | --- |
| 13. | Critical control points | To avoid cross contamination, it is advised to not produce inoculum of different races in the same room. |

Ad. 72: Resistance to colonization by *Aphis gossypii*

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Aphis gossypii* |
| 2. | Quarantine status | no |
| 3. | Host species | *Cucumis melo* |
| 4. | Source of inoculum | INRA GAFL (FR) |
| 5. | Isolate | NM1 clone |
| 6. | Establishment isolate identity | - |
| 7. | Establishment pathogenicity | on susceptible plants |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | living plant (obligate parasite), e.g. young plants of Melon or Cucumber |
| 8.2 | Multiplication variety | on susceptible variety (Corona, Védrantais, Ventura) |
| 8.3 | Plant stage at inoculation | at first leaf (measuring around 2-3 cm) |
| 8.4 | Inoculation medium | - |
| 8.5 | Inoculation method | deposit a piece of infested leaf (visual appreciation) or ten adult wingless aphids per plant |
| 8.6 | Harvest of inoculum | - |
| 8.7 | Check of harvested inoculum | - |
| 8.8 | Shelflife/viability inoculum | - |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | 30 |
| 9.2 | Number of replicates | e.g. 3 |
| 9.3 | Control varieties |  |
|  | [1] absent | Védrantais |
|  | [9] present | AR Hale’s Best Jumbo, AR Top Mark, Virgos |
| 9.4 | Test design | - |
| 9.5 | Test facility | - |
| 9.6 | Temperature | 21-24°C day/16-20°C night |
| 9.7 | Light | 16 hours per day |
| 9.8 | Season | - |
| 9.9 | Special measures | - |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | - |
| 10.2 | Quantification inoculum | at least 10 adults wingless aphid per plant |
| 10.3 | Plant stage at inoculation | 1st leaf measuring around 2-3 cm |
| 10.4 | Inoculation method | deposit of a piece of infested leaf or ten adult wingless aphids per plant |
| 10.5 | First observation | 1-4 days post inoculation |
| 10.6 | Second observation | - |
| 10.7 | Final observations | 5-10 days post inoculation |
| 11. | Observations |  |
| 11.1 | Method | visual, to compare with standards |
| 11.2 | Observation scale |  |
|  | [1] absent | 9 or 10 adult aphids per plant; larvae frequent, plants covered with aphids, shriveled leaves |
|  | [9] present | less than 7 adult aphids per plant; larvae rare.  Remark: counting is not compulsory, it can be a visual assessment of the respective level of colonization. |
| 11.3 | Validation of test | on standards |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | QL |
| 13. | Critical control points | Low aphid density to avoid having too many winged types. “Synchronous”-type breeding in order to have only aphids of the same age and, therefore, at the same growing stage on a plant.  Normally *Aphis gossypii* is viviparous, but sometimes (autumn, on particular crops) may produce eggs. |

Ad. 73: Resistance to *Zucchini yellow mosaic virus* (ZYMV)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Zucchini yellow mosaic virus* (ZYMV) |
| 2. | Quarantine status | no |
| 3. | Host species | *Cucumis melo* |
| 4. | Source of inoculum | GEVES (FR) |
| 5. | Isolate | F strain (e.g.strain 1318 Fn) or a NF strain (e.g. strain E15) |
| 6. | Establishment isolate identity | use standard varieties, flaccida necrosis on Généris (Zym+/ Fn) |
| 7. | Establishment pathogenicity | on susceptible melon varieties - as above |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | - |
| 8.2 | Multiplication variety | susceptible variety (e.g.: Védrantais) |
| 8.3 | Plant stage at inoculation | first leaf appearing |
| 8.4 | Inoculation medium | fresh and dried leaves homogenized, in PBS with carborundum |
| 8.5 | Inoculation method | rubbing |
| 8.6 | Harvest of inoculum | on symptomatic leaves |
| 8.7 | Check of harvested inoculum | - |
| 8.8 | Shelflife/viability inoculum | - |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | at least 30 |
| 9.2 | Number of replicates | e.g. 3 |
| 9.3 | Control varieties | Védrantais, Jador, Cardillo (susceptible) Hannah’s Choice, Lunaduke, PI 414723 (resistant) |
| 9.4 | Test design | - |
| 9.5 | Test facility | growth chamber |
| 9.6 | Temperature | 22°C - 25°C during day and 18°C during night |
| 9.7 | Light | 12 hours |
| 9.8 | Season | all seasons |
| 9.9 | Special measures | - |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | ice cold buffer solution: Fresh leaves homogenized in PBS and carborundum |
| 10.2 | Quantification inoculum | - |
| 10.3 | Plant stage at inoculation | cotyledon expanded or first emergent leaf |
| 10.4 | Inoculation method | mechanical inoculation by rubbing of cotyledons with inoculum |
| 10.5 | First observation | - |
| 10.6 | Second observation | - |
| 10.7 | Final observations | 14-15 days post inoculation |
| 11. | Observations |  |
| 11.1 | Method | visual, comparative |
| 11.2 | Observation scale |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Resistance to ZYMV | | ZYMV - Strain F e.g. strain 1318 Fn | ZYMV - Strain NF e.g.: strain E15 |
| 1 | absent | Mosaic, non wilting | Mosaic, non wilting |
| Necrosis + slow wilting (flaccida necrosis) |
| Necrosis + fast wilting  (flaccida necrosis) |
| 9 | present | chlorotic or necrotic systemic lesions  and possibly an apical necrosis | |
| 9 | present | No symptom | |

|  |  |  |
| --- | --- | --- |
| 11.3 | Validation of test | on Standards |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | QL |
| 13. | Critical control points | The three distinct phenotypes associated with susceptibility to ZYMV strain F are connected with Fn gene.  The Zym gene is epistatic on the Fn gene.  The Fn gene modifies the susceptibility symptom expression of strain F: Fn/Fn is associated with fast wilting and necrosis (Flaccida-necrosis), Fn/Fn+ with the same reaction, but slower. Flaccida-necrosis is a form of systemic hypersensitivity, which is interpreted as susceptibility.  The Fn gene has no influence on the symptom expression of resistant varieties. |

Ad. 74: Resistance to *Papaya ringspot virus* (PRSV), Guadeloupe strain and E2 strain

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Papaya ringspot virus* (PRSV) |
| 2. | Quarantine status | no |
| 3. | Host species | *Cucumis melo* |
| 4. | Source of inoculum | INRA Pathology - Avignon (FR) |
| 5. | Isolate | Guadeloupe strainand E2 strain |
| 6. | Establishment isolate identity |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Gene Pvr | Standards | Symptoms | Behavior against  PRSV Guadeloupe strain |
| allele (Prv+) | Védrantais | Mosaic (vein-clearing) | susceptible |
| allele (Prv2) | 72-025, PI 414723  Hannah’s Choice | No systemic symptoms  or  Irregular local necrotic lesions on cotyledons | resistant |
| allele (Prv1) | WMR29 | No systemic symptoms  Occasional local necrotic lesions on cotyledons | resistant |

|  |  |  |  |
| --- | --- | --- | --- |
| Gene Pvr | Standards | Symptoms | Behavior against  PRSV E2 strain |
| allele (Prv+) | Védrantais | Mosaic (vein-clearing) | susceptible |
| allele (Prv2) | 72-025, PI 414723  Hannah’s Choice | Apical necrosis  Necrosis of plant instead of local lesions | susceptible |
| allele (Prv1) | WMR29 | No systemic symptoms or few systemic chloronecrotic symptoms  Occasional local necrotic lesions on cotyledons | resistant |

|  |  |  |
| --- | --- | --- |
| 7. | Establishment pathogenicity | - |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | - |
| 8.2 | Multiplication variety | pre-multiplication of the virus on non-wilting variety (Védrantais) prior to testing |
| 8.3 | Plant stage at inoculation | First leaf appearing |
| 8.4 | Inoculation medium | PBS with carborundum |
| 8.5 | Inoculation method | rubbing |
| 8.6 | Harvest of inoculum | Fresh or dried leaves homogenized in PBS and carborundum |
| 8.7 | Check of harvested inoculum | - |
| 8.8 | Shelflife/viability inoculum | - |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | at least 30 |
| 9.2 | Number of replicates | e.g. 3 |
| 9.3 | Control varieties | Védrantais (susceptible) Hannah’s Choice (resistant to Guadeloupe strain (Prv2/ Prv+)) WMR 29 (resistant to E2 strain (Prv1/ Prv+)) |
| 9.4 | Test design | - |
| 9.5 | Test facility | - |
| 9.6 | Temperature | 25oC /18oC |
| 9.7 | Light | 12 h |
| 9.8 | Season | - |
| 9.9 | Special measures | - |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | fresh leaves homogenized in PBS and carborundum |
| 10.2 | Quantification inoculum | - |
| 10.3 | Plant stage at inoculation | first emergent leaf |
| 10.4 | Inoculation method | mechanical inoculation by rubbing cotyledons with inoculums |
| 10.5 | First observation | 15 days post inoculation |
| 10.6 | Second observation | - |
| 10.7 | Final observations | 20 days post inoculation |
| 11. | Observations | visual, comparative |
| 11.1 | Method |  |
| 11.2 | Observation scale |  |

|  |  |  |
| --- | --- | --- |
| Resistance to PRSV - Guadeloupe strain | Gene Pvr | Symptoms |
| [1] absent | allele (Prv+) | Mosaic (vein-clearing) |
| [9] present | allele (Prv2) | No systemic symptoms Irregular local necrotic lesions on cotyledons |
| [9] present | allele (Prv1) | No systemic symptoms Occasional local necrotic lesions on cotyledons |

|  |  |  |
| --- | --- | --- |
| Resistance to PRSV –  E2 strain | Gene Pvr | Symptoms |
| [1] absent | allele (Prv+) | Mosaic (vein-clearing) |
| [1] absent | allele (Prv2) | Apical necrosis Necrosis of plant instead of local lesions |
| [9] present | allele (Prv1) | No systemic symptoms or few systemic chloronecrotic symptoms Occasional local necrotic lesions on cotyledons |

|  |  |  |
| --- | --- | --- |
| 11.3 | Validation of test | on standards |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | QL |
| 13. | Critical control points | - |

Ad. 75: Resistance to *Melon necrotic spot virus* (MNSV), Strain 0 (MNSV: 0)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Melon necrotic spot virus* strain 0 (MNSV: 0) |
| 3. | Host species | *Cucumis melo* |
| 4. | Source of inoculum | GEVES[[9]](#footnote-9) (FR) |
| 5. | Isolate | E8 |
| 6. | Establishment isolate identity | Védrantais (susceptible) PMR5, VA 435, Virgos (resistant) |
| 7. | Establishment pathogenicity | on susceptible plant |
| 8. | Multiplication inoculum |  |
| 8.1 | Multiplication medium | living plant |
| 8.2 | Multiplication variety | pre-multiplication of the virus on non-wilting variety (Védrantais) prior to testing |
| 8.3 | Plant stage at inoculation | 10.3 |
| 8.5 | Inoculation method | 10.4 |
| 8.6 | Harvest of inoculum | 10.1 |
| 8.7 | Check of harvested inoculum | symptomatic leaves |
| 8.8 | Shelflife/viability inoculum | on susceptible variety |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | at least 30 |
| 9.2 | Number of replicates | e.g. 3 |
| 9.3 | Control varieties | Védrantais (susceptible) Cyro, Primal, Virgos, Yellow Fun, (resistant) |
| 9.4 | Test design | add non inoculated plants |
| 9.5 | Test facility | growth chamber |
| 9.6 | Temperature | 25°C during day and 18°C during night or 22°C constant |
| 9.7 | Light | 12 h per day |
| 9.8 | Season | all seasons |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | fresh leaves homogenized in PBS and carborundum |
| 10.3 | Plant stage at inoculation | cotyledon expanded or 1st emergent leaf |
| 10.4 | Inoculation method | mechanical inoculation by rubbing of cotyledons with inoculum |
| 10.7 | Final observations | 8-15 days after inoculation |
| 11. | Observations |  |
| 11.1 | Method | Visual |
| 11.2 | Observation scale |  |
|  | [1] absent | necrotic lesions on the inoculated organs, possible systemic reaction (depends on condition, and varieties), possible death of plant |
|  | [9] present | no lesions |
| 11.3 | Validation of test | on standards |
| 12. | Interpretation of data in terms of UPOV characteristic states | QL |
| 13. | Critical control points | To check the pathogen identity, Virgos is resistant to MNSV: 0 and susceptible to the new MNSV strain. |

Ad. 76: Resistance to *Cucumber mosaic virus* (CMV)

|  |  |  |
| --- | --- | --- |
| 1. | Pathogen | *Cucumber mosaic virus* (CMV) |
| 2. | Quarantine status | no |
| 3. | Host species | *Cucumis melo* |
| 4. | Source of inoculum | GEVES (FR) |
| 5. | Isolate | Use “common” strains (e.g. Tl, P9) |
| 6. | Establishment isolate identity | Védrantais, 72-025 (susceptible) PI 161375, Virgos (resistant) |
| 7. | Establishment pathogenicity | on susceptible melon varieties |
| 8. | Multiplication inoculum | don’t use leaves dried with CaCl2 to inoculate, do a multiplication of the inoculum on susceptible plants |
| 8.1 | Multiplication medium | living plant |
| 8.2 | Multiplication variety | susceptible variety (e.g. Védrantais) |
| 8.3 | Plant stage at inoculation | cotyledon expanded or first leaf appearing |
| 8.4 | Inoculation medium | ice-cold buffer solution |
| 8.5 | Inoculation method | Inoculation by rubbing. Optional: after a few minutes, rinse the cotyledons with running water. |
| 8.6 | Harvest of inoculum | symptomatic leaves, e.g.: 1 g leaves with 4 mL buffer - 0,03 M PBS with 0.2% DIECA freshly added, addition of activated charcoal. |
| 8.7 | Check of harvested inoculum | - |
| 8.8 | Shelflife/viability inoculum | about 2 h |
| 9. | Format of the test |  |
| 9.1 | Number of plants per genotype | at least 30 plants |
| 9.2 | Number of replicates | e.g. 3 |
| 9.3 | Control varieties | Védrantais (susceptible) Lunaduke, Virgos (resistant) |
| 9.4 | Test design | - |
| 9.5 | Test facility | climatic room or glasshouse |
| 9.6 | Temperature | 22°C constant |
| 9.7 | Light | 12 hours at least |
| 9.8 | Season | all seasons in climatic room, in glasshouse, strong environmental effect on the test severity (more severe in winter, too soft in summertime) |
| 9.9 | Special measures | - |
| 10. | Inoculation |  |
| 10.1 | Preparation inoculum | Fresh leaves homogenized in ice-cold buffer solution- in PBS and carborundum (active charcoal), with 0.2% DIECA freshly added. |
| 10.2 | Quantification inoculum | - |
| 10.3 | Plant stage at inoculation | cotyledon expanded or first leaf appearing |
| 10.4 | Inoculation method | Inoculation by rubbing. After a few minutes, rinse the cotyledons with running water, when uses activated charcoal. |
| 10.5 | First observation | - |
| 10.6 | Second observation | - |
| 10.7 | Final observations | 7-8 days after inoculation |
| 11. | Observations |  |
| 11.1 | Method | visual, comparative |
| 11.2 | Observation scale |  |
|  | [1] absent | Mosaics |
|  | [9] present | No symptoms or necrotic spot or very weak symptoms in case of a more aggressive strain like T1.  *Remarks:* P9 strain brings out “aucuba” mosaic on susceptible varieties (aggressive symptoms)  P9 strain is less virulent than Tl strain. |
| 11.3 | Validation of test | on control varieties |
| 11.4 | Off-types | - |
| 12. | Interpretation of data in terms of UPOV characteristic states | QL |
| 13. | Critical control points | - When light intensity and daylight are not sufficient (winter period), resistant plants (in particular PI 161375) may present chlorotic lesions on the first leaf.  - Virgos seeds usually germinate better than seeds of  PI 161375  - Songwhan Charmi = PI 161375: name of the melon variety, on which this strain was identified. The “song” strains break the common resistance to CMV (e.g.: “song” strains 14, T2).  - Intermediate reactions may occur; the resistance is polygenic. |

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# Technical Questionnaire

| TECHNICAL QUESTIONNAIRE | | | | Page {x} of {y} | | Reference Number: | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | |  | |  | | | | |
|  | | | |  | | Application date: | | | | |
|  | | | |  | | (not to be filled in by the applicant) | | | | |
| TECHNICAL QUESTIONNAIRE  to be completed in connection with an application for plant breeders’ rights | | | | | | | | | | |
| 1. Subject of the Technical Questionnaire | | | | | | | | | | |
|  | | |  | | | | | |  | |
| 1.1 Botanical name | | | *Cucumis melo* L*.* | | | | | |  | |
|  | | |  | | | | | |  | |
| 1.2 Common Name | | | Melon | | | | | |  | |
|  | | | | | | | | | | |
| 2. Applicant | | | | | | | | | | |
|  | | |  | | | | | |  | |
| Name | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| Address | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| Telephone No. | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| Fax No. | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| E-mail address | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| Breeder (if different from applicant) | | | | | | | | |  | |
|  | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| 3. Proposed denomination and breeder’s reference | | | | | | | | | | |
|  | | |  | | | | | |  | |
| Proposed denomination | | |  | | | | | |  | |
| (if available) | | |  | | | | | |  | |
| Breeder’s reference | | |  | | | | | |  | |
|  | | |  | | | | | |  | |
| 4. Information on the breeding scheme and propagation of the variety  4.1 Breeding scheme  Variety resulting from:  4.1.1 Crossing  (a) controlled cross [ ]  (please state parent varieties)  (b) partially known cross [ ]  (please state known parent variety(ies))  (c) totally unknown cross [ ]  4.1.2 Discovery and development [ ]  (please state where and when discovered  and how developed)  4.1.3 Other [ ]  (please provide details)  4.2 Method of propagating the variety | | | | | | | | | | |
| 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 (12)** | **Inflorescence: sex expression (at full flowering)** | | | | | |  | | |  |
|  | monoecious | | | | | | Alpha, Categoría | | | 1[ ] |
|  | andromonoecious | | | | | | Piel de Sapo | | | 2[ ] |
| **5.2 (13)** | **Young fruit: hue of green color of skin** | | | | | |  | | |  |
|  | whitish green | | | | | | Geasol | | | 1[ ] |
|  | yellowish green | | | | | | Fimel | | | 2[ ] |
|  | green | | | | | | Lucas | | | 3[ ] |
|  | greyish green | | | | | | Spanglia | | | 4[ ] |
| **5.3 (14)** | **Young fruit: intensity of green color of skin** | | | | | |  | | |  |
|  | very light | | | | | | Solarking | | | 1[ ] |
|  | very light to light | | | | | |  | | | 2[ ] |
|  | light | | | | | | Fimel | | | 3[ ] |
|  | light to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Eros | | | 5[ ] |
|  | medium to dark | | | | | |  | | | 6[ ] |
|  | dark | | | | | | Galia | | | 7[ ] |
|  | dark to very dark | | | | | |  | | | 8[ ] |
|  | very dark | | | | | | Edén | | | 9[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.4 (24)** | **Fruit: length** | | | | | |  | | |  |
|  | very short | | | | | | Doublon, Golden Crispy | | | 1[ ] |
|  | very short to short | | | | | |  | | | 2[ ] |
|  | short | | | | | | Topper, Védrantais | | | 3[ ] |
|  | short to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Marina, Spanglia | | | 5[ ] |
|  | medium to long | | | | | |  | | | 6[ ] |
|  | long | | | | | | Categoría, Toledo | | | 7[ ] |
|  | long to very long | | | | | |  | | | 8[ ] |
|  | very long | | | | | | Katsura Giant, Valdivia | | | 9[ ] |
| **5.5 (25)** | **Fruit: diameter** | | | | | |  | | |  |
|  | very narrow | | | | | | Banana, Golden Crispy | | | 1[ ] |
|  | very narrow to narrow | | | | | |  | | | 2[ ] |
|  | narrow | | | | | | Alpha, Maestro | | | 3[ ] |
|  | narrow to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Categoría, Galia | | | 5[ ] |
|  | medium to broad | | | | | |  | | | 6[ ] |
|  | broad | | | | | | Albino, Kinka | | | 7[ ] |
|  | broad to very broad | | | | | |  | | | 8[ ] |
|  | very broad | | | | | | Noir des Carmes | | | 9[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.6 (28)** | **Fruit: shape in longitudinal section** | | | | | |  | | |  |
|  | ovate | | | | | | De Cavaillon, Piolín | | | 1[ ] |
|  | medium elliptic | | | | | | Piel de Sapo | | | 2[ ] |
|  | broad elliptic | | | | | | Corin, Sardo | | | 3[ ] |
|  | circular | | | | | | Alpha, Galia | | | 4[ ] |
|  | quadrangular | | | | | | Zatta | | | 5[ ] |
|  | oblate | | | | | | Jívaro, Noir de Carmes | | | 6[ ] |
|  | obovate | | | | | | Cganchi | | | 7[ ] |
|  | elongated | | | | | | Alficoz, Banana | | | 8[ ] |
| **5.7 (29)** | **Fruit: ground color of skin** | | | | | |  | | |  |
|  | white | | | | | | Albino, Honey Dew | | | 1[ ] |
|  | yellow | | | | | | Amarillo-Canario, Edén, Galia, Passport, Solarking | | | 2[ ] |
|  | green | | | | | | Gohyang, Piel de Sapo | | | 3[ ] |
|  | grey | | | | | | Geaprince, Geamar, Romeo, Sirio, Supporter, Védrantais | | | 4[ ] |
| **5.8 (31)** | **Fruit: hue of ground color of skin** | | | | | |  | | |  |
|  | absent or very weak | | | | | | Amarillo-Canario, Albino, Piel de Sapo, Sirio | | | 1[ ] |
|  | whitish | | | | | | Romeo | | | 2[ ] |
|  | yellowish | | | | | | Geaprince, Supporter | | | 3[ ] |
|  | orange | | | | | | Edén | | | 4[ ] |
|  | ochre | | | | | | Passport | | | 5[ ] |
|  | greenish | | | | | | Geamar, Honey Dew, Solarking | | | 6[ ] |
|  | greyish | | | | | | Gohyang | | | 7[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.9 (32)** | **Fruit: density of dots** | | | | | |  | | |  |
|  | absent or very sparse | | | | | | Charentais | | | 1[ ] |
|  | very sparse to sparse | | | | | |  | | | 2[ ] |
|  | sparse | | | | | |  | | | 3[ ] |
|  | sparse to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Petit Gris de Rennes | | | 5[ ] |
|  | medium to dense | | | | | |  | | | 6[ ] |
|  | dense | | | | | | Piel de Sapo | | | 7[ ] |
|  | dense to very dense | | | | | |  | | | 8[ ] |
|  | very dense | | | | | | Albino | | | 9[ ] |
| **5.10 (36)** | **Fruit: density of patches** | | | | | |  | | |  |
|  | absent or very sparse | | | | | | Rochet | | | 1[ ] |
|  | very sparse to sparse | | | | | |  | | | 2[ ] |
|  | sparse | | | | | |  | | | 3[ ] |
|  | sparse to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Braco | | | 5[ ] |
|  | medium to dense | | | | | |  | | | 6[ ] |
|  | dense | | | | | | Piel de Sapo | | | 7[ ] |
|  | dense to very dense | | | | | |  | | | 8[ ] |
|  | very dense | | | | | | Oranje Ananas | | | 9[ ] |
| **5.11 (38)** | **Fruit: warts** | | | | | |  | | |  |
|  | absent | | | | | | Piel de Sapo | | | 1[ ] |
|  | present | | | | | | Zatta | | | 9[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.12 (43)** | **Fruit: grooves** | | | | | |  | | |  |
|  | absent or very weakly expressed | | | | | | Piel de Sapo, Arava | | | 1[ ] |
|  | weakly expressed | | | | | | Total, Hobby | | | 2[ ] |
|  | strongly expressed | | | | | | Védrantais, Galia | | | 3[ ] |
| **5.13 (45)** | **Fruit: depth of grooves** | | | | | |  | | |  |
|  | very shallow | | | | | | Amber | | | 1[ ] |
|  | very shallow to shallow | | | | | |  | | | 2[ ] |
|  | shallow | | | | | | Galia | | | 3[ ] |
|  | shallow to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Alpha | | | 5[ ] |
|  | medium to deep | | | | | |  | | | 6[ ] |
|  | deep | | | | | | Panamá, Supermarket | | | 7[ ] |
|  | deep to very deep | | | | | |  | | | 8[ ] |
|  | very deep | | | | | | Noir des Carmes,  Sucrin de Tours | | | 9[ ] |
| **5.14 (47)** | **Fruit: creasing of surface** | | | | | |  | | |  |
|  | absent or very weak | | | | | | Védrantais | | | 1[ ] |
|  | very weak to weak | | | | | |  | | | 2[ ] |
|  | weak | | | | | | Melchor, Sirocco | | | 3[ ] |
|  | weak to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Costa, Piolín | | | 5[ ] |
|  | medium to strong | | | | | |  | | | 6[ ] |
|  | strong | | | | | | Tendral Negro | | | 7[ ] |
|  | strong to very strong | | | | | |  | | | 8[ ] |
|  | very strong | | | | | | Balbey, Kirkagac | | | 9[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.15 (48)** | **Fruit: cork formation** | | | | | |  | | |  |
|  | absent | | | | | | Alpha | | | 1[ ] |
|  | present | | | | | | Dalton | | | 9[ ] |
| **5.16 (49)** | **Fruit: thickness of cork layer** | | | | | |  | | |  |
|  | very thin | | | | | | Amarillo Oro | | | 1[ ] |
|  | very thin to thin | | | | | |  | | | 2[ ] |
|  | thin | | | | | | Riosol, Védrantais | | | 3[ ] |
|  | thin to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Marina | | | 5[ ] |
|  | medium to thick | | | | | |  | | | 6[ ] |
|  | thick | | | | | | Geamar, PMR 45 | | | 7[ ] |
|  | thick to very thick | | | | | |  | | | 8[ ] |
|  | very thick | | | | | | Honey Rock, Perlita | | | 9[ ] |
| **5.17 (50)** | **Fruit: pattern of cork formation** | | | | | |  | | |  |
|  | dots only | | | | | | Hermes, Védrantais | | | 1[ ] |
|  | dots and linear | | | | | | Jivaro, Topper | | | 2[ ] |
|  | linear only | | | | | | Futuro, Riosol | | | 3[ ] |
|  | linear and netted | | | | | | Anatol, Chantal | | | 4[ ] |
|  | netted only | | | | | | Galia, Perlita | | | 5[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.18 (51)** | **Fruit: density of pattern of cork formation** | | | | | |  | | |  |
|  | very sparse | | | | | | Alpha, Amarillo Oro | | | 1[ ] |
|  | very sparse to sparse | | | | | |  | | | 2[ ] |
|  | sparse | | | | | | Védrantais | | | 3[ ] |
|  | sparse to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Regal, Vital | | | 5[ ] |
|  | medium to dense | | | | | |  | | | 6[ ] |
|  | dense | | | | | | Galia, Geamar | | | 7[ ] |
|  | dense to very dense | | | | | |  | | | 8[ ] |
|  | very dense | | | | | | Honey Rock, Perlita | | | 9[ ] |
| **5.19 (54)** | Fruit: main color of flesh | | | | | |  | | |  |
|  | white | | | | | | Piel de Sapo | | | 1[ ] |
|  | greenish white | | | | | | Galia | | | 2[ ] |
|  | green | | | | | | Radical | | | 3[ ] |
|  | yellowish white | | | | | | Guaraní | | | 4[ ] |
|  | orange | | | | | | Védrantais | | | 5[ ] |
|  | reddish orange | | | | | | Magenta | | | 6[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.20 (60)** | **Seed: length** | | | | | |  | | |  |
|  | very short | | | | | | Geumssaraki, Golden Crispi | | | 1[ ] |
|  | very short to short | | | | | |  | | | 2[ ] |
|  | short | | | | | | Elario, Katsura Giant | | | 3[ ] |
|  | short to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Arava, Sancho | | | 5[ ] |
|  | medium to long | | | | | |  | | | 6[ ] |
|  | long | | | | | | Amarillo Oro, Toledo | | | 7[ ] |
|  | long to very long | | | | | |  | | | 8[ ] |
|  | very long | | | | | | Albino | | | 9[ ] |
| **5.21 (62)** | **Seed: shape** | | | | | |  | | |  |
|  | not pine-nut shape | | | | | | Toledo | | | 1[ ] |
|  | pine-nut shape | | | | | | Piel de Sapo | | | 2[ ] |
| **5.22 (63)** | **Seed: color** | | | | | |  | | |  |
|  | whitish | | | | | | Amarillo Oro s.b. | | | 1[ ] |
|  | cream yellow | | | | | | Galia, Piel de Sapo | | | 2[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.23 (68)** | **Shelf life of fruit** | | | | | |  | | |  |
|  | very short | | | | | | Charentais | | | 1[ ] |
|  | very short to short | | | | | |  | | | 2[ ] |
|  | short | | | | | | Galia | | | 3[ ] |
|  | short to medium | | | | | |  | | | 4[ ] |
|  | medium | | | | | | Clipper | | | 5[ ] |
|  | medium to long | | | | | |  | | | 6[ ] |
|  | long | | | | | | Piel de Sapo | | | 7[ ] |
|  | long to very long | | | | | |  | | | 8[ ] |
|  | very long | | | | | | Tendral Negro | | | 9[ ] |
| **5.24 (69.1)** | **Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom) *–* Race 0 (Fom: 0)** | | | | | |  | | |  |
|  | absent | | | | | | Atos, Charentais T | | | 1[ ] |
|  | present | | | | | | Cadence, Charentais Fom-2, Dibango, Jubilo, Karakal, Védrantais | | | 9[ ] |
| **5.25 (69.2)** | **Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom) *-* Race 1 (Fom: 1)** | | | | | |  | | |  |
|  | absent | | | | | | Atos, Charentais T, Védrantais | | | 1[ ] |
|  | present | | | | | | Cadence, Charentais Fom-2, Dibango, Jubilo, Karakal | | | 9[ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.26 (69.3)** | **Resistance to *Fusarium oxysporum* f. sp. *melonis* (Fom) *-* Race 2 (Fom: 2)** | | | | | |  | | |  |
|  | absent | | | | | | Atos, Charentais Fom-2, Charentais T, Dibango, Marianna | | | 1[ ] |
|  | present | | | | | | Cadence, Charentais Fom-1, Jubilo, Karakal, Perlita, Védrantais | | | 9[ ] |
| **5.27 (69.4)** | **Resistance to *Fusarium oxysporum* f. sp. *melonis -* Race 1.2 (Fom: 1.2)** | | | | | |  | | |  |
|  | absent | | | | | | Graffio, Prity, Virgos | | | 1[ ] |
|  | present | | | | | | Isabelle, Kyriel, Lunasol, Meliance, Piboule | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.28 (70.1)** | **Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) - Race 1 (Px: 1)** | | | | | |  | | |  |
|  | absent or low | | | | | | Védrantais | | | 1[ ] |
|  | medium | | | | | | Escrito | | | 2[ ] |
|  | high | | | | | | Arum | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.29 (70.2)** | **Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) - Race 2 (Px: 2)** | | | | | |  | | |  |
|  | absent or low | | | | | | Védrantais | | | 1[ ] |
|  | medium | | | | | | Escrito, Pendragon | | | 2[ ] |
|  | high | | | | | | Arum | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.30 (70.3)** | **Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) - Race 3 (Px: 3)** | | | | | |  | | |  |
|  | absent or low | | | | | | Védrantais | | | 1[ ] |
|  | medium | | | | | | Arago, Durango | | | 2[ ] |
|  | high | | | | | | Arum | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.31 (70.4)** | **Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) - Race 5 (Px: 5)** | | | | | |  | | |  |
|  | absent or low | | | | | | Védrantais | | | 1[ ] |
|  | medium | | | | | | Arago, Durango | | | 2[ ] |
|  | high | | | | | | Arum | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.32 (70.5)** | **Resistance to *Podosphaera xanthii* (Px) (ex *Sphaerotheca fuliginea)* (Powdery mildew) - Race 3-5 (Px: 3.5)** | | | | | |  | | |  |
|  | absent or low | | | | | | Védrantais | | | 1[ ] |
|  | medium | | | | | | Arago, Durango | | | 2[ ] |
|  | high | | | | | | Arum | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.33 (71)** | **Resistance to *Golovinomyces cichoracearum*  *(Erysiphe cichoracearum)* Race 1 (Powdery mildew)** | | | | | |  | | |  |
|  | susceptible | | | | | | Escrito, Score, Védrantais | | | 1[ ] |
|  | moderately resistant | | | | | | Flores, Anasta | | | 2[ ] |
|  | highly resistant | | | | | | Cézanne, Heliobel, Théo | | | 3[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.34 (72)** | **Resistance to colonization by *Aphis gossypii*** | | | | | |  | | |  |
|  | absent | | | | | | Védrantais | | | 1[ ] |
|  | present | | | | | | AR Hale’s Best Jumbo,  AR Top Mark, Godiva, Heliobel, Virgos | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
|  | Characteristics | | | | | | Example Varieties | | | Note |
| **5.35 (73)** | **Resistance to *Zucchini yellow mosaic virus* (ZYMV)** | | | | | |  | | |  |
|  | absent | | | | | | Cardillo, Généris, Jador, Védrantais | | | 1[ ] |
|  | present | | | | | | Hannah’s Choice, Lunaduke | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.36 (74.1)** | **Resistance to *Papaya ringspot virus* (PRSV) - Guadeloupe strain** | | | | | |  | | |  |
|  | absent | | | | | | Védrantais | | | 1[ ] |
|  | present | | | | | | Hannah’s Choice | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.37 (74.2)** | **Resistance to *Papaya ringspot virus* (PRSV) - E2 strain** | | | | | |  | | |  |
|  | absent | | | | | | Hannah’s Choice, Védrantais | | | 1[ ] |
|  | present | | | | | | WMR29 | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.38 (75)** | **Resistance to *Melon necrotic spot virus* (MNSV) Strain 0 (MNSV: 0)** | | | | | |  | | |  |
|  | absent | | | | | | Védrantais | | | 1[ ] |
|  | present | | | | | | Cyro, Primal, Virgos, Yellow Fun | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| **5.39 (76)** | **Resistance to *Cucumber mosaic virus* (CMV)** | | | | | |  | | |  |
|  | absent | | | | | | Cézanne, Dalton | | | 1[ ] |
|  | present | | | | | | Lunaduke, Virgos | | | 9[ ] |
|  | not tested | | | | | |  | | | [ ] |
| 6. Similar varieties and differences from these varieties  *Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.* | | | | | | | | | | |
| Denomination(s) of variety(ies) similar to your candidate variety | | Characteristic(s) in which your candidate variety differs from the similar variety(ies) | | | Describe the expression of the characteristic(s) for the **similar** variety(ies) | | | Describe the expression of the characteristic(s) for **your** candidate variety | | |
| *Example* | | *Density of pattern of cork formation* | | | *dense* | | | *medium* | | |
|  | |  | | |  | | |  | | |
|  | |  | | |  | | |  | | |
| 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  Yes [ ] No [ ]  If yes, please give details:  ………………………………………………………………………………………… | | | | | | | | | | |
| 7.3 Other information  A representative color photograph of the variety should accompany the Technical Questionnaire. | | | | | | | | | | |
| 8. Authorization for release  (a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?  Yes [ ] No [ ]  (b) Has such authorization been obtained?  Yes [ ] No [ ]  If the answer to (b) is yes, please attach a copy of the authorization. | | | | | | | | | | |
| 9. Information on plant material to be examined or submitted for examination  9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.  9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:  (a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]  b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]  (c) Tissue culture Yes [ ] No [ ]  (d) Other factors Yes [ ] No [ ]  Please provide details for where you have indicated “yes”.  …………………………………………………………… | | | | | | | | | | |
| 10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:  Applicant’s name  Signature Date | | | | | | | | | | |

[End of document]

1. \* 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.] [↑](#footnote-ref-1)
2. [matref@geves.fr](mailto:matref@geves.fr) [↑](#footnote-ref-2)
3. Harmores 3 CPVO project <https://cpvo.europa.eu/sites/default/files/documents/report_harmores_3_final_meeting_v0_0.pdf> [↑](#footnote-ref-3)
4. ISF EG DRT Fom: 2 resistance in Melon – <https://worldseed.org/document/melon-fusarium-wilt-fom-isf-project-report/> [↑](#footnote-ref-4)
5. [matref@geves.fr](mailto:matref@geves.fr) [↑](#footnote-ref-5)
6. Harmores 3 CPVO project (<https://cpvo.europa.eu/sites/default/files/documents/report_harmores_3_final_meeting_v0_0.pdf>) [↑](#footnote-ref-6)
7. [matref@geves.fr](mailto:matref@geves.fr) [↑](#footnote-ref-7)
8. Harmores 3 CPVO project (<https://cpvo.europa.eu/sites/default/files/documents/report_harmores_3_final_meeting_v0_0.pdf>) [↑](#footnote-ref-8)
9. matref@geves.fr [↑](#footnote-ref-9)