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|  | |  | E  TG/CUCUR\_MMO(proj.3)  **ORIGINAL:** English  DATE: 2014-09-15 | |
| INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS | | | | |
| Geneva | | | | |
| DRAFT | | |

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| --- | --- | --- |
|  | ***Cucurbita maxima* X *Cucurbita moschata***  **interspecific hybrids**  UPOV Code: CUCUR\_MMO  *Cucurbita maxima* Duch. X*Cucurbita moschata* Duch. | [[1]](#footnote-1)\* |

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

prepared by experts from France

to be considered by the

Enlarged Editorial Committee at its meeting

to be held in Geneva, on January 7 and 8, 2015

Disclaimer: this document does not represent UPOV policies or guidance

Alternative Names:\*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
| *Cucurbita maxima* Duch. x*Cucurbita moschata* Duch. | *Cucurbita maxima* X *Cucurbita moschata* | *Cucurbita maxima* X *Cucurbita moschata* | *Cucurbita maxima* X *Cucurbita moschata* | *Cucurbita maxima* X *Cucurbita moschata* |

|  |
| --- |
| 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.

Other associated UPOV documents: **TG/155**: *Cucurbita maxima* Duch.

**TG/234**: *Cucurbita moschata* Duch.

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# Subject of these Test Guidelines

These Test Guidelines apply to all varieties of interspecific hybrids of *Cucurbita maxima* Duch. X *Cucurbita moschata* Duch..

# 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 seeds.

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

200g – 1.500 seeds.

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

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.

## 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 at least 2 replicates.

3.4.2 When resistances characteristics are used for assessing distinctness, uniformity and stability, records must be taken under conditions of controlled infection and, unless otherwise specified, on at least 20 plants.

3.4.3 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 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.

Further guidance is provided in documents TGP/9 “Examining Distinctness” and TGP/8 “Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability”.

### 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.

### 4.1.4 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test, disregarding any off-type plants.

### 4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation 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

VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

## 4.2 Uniformity

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

4.2.2 For the assessment of uniformity a population standard of 1% for hybrid varieties with an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, the maximum number of off-types allowed would be 1 off-type.

4.2.3 An additional tolerance of off-types can be accepted for clear cases of plants obviously resulting from the selfing of a parent line in single-cross hybrids. In addition, a population standard of 3% and an acceptance probability of at least 95% should be applied for inbred plants obviously resulting from the selfing of a parent line. In the case of a sample size of 20 plants, 2 inbred plants are allowed.

## 4.3 Stability

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

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

# 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:

1. Plant: length of main stem (characteristic 1)
2. Leaf blade: incisions (characteristic 3)
3. Fruit: shape (characteristic 9)
4. Fruit: profile at stem end (characteristic 13)
5. Fruit: ground color of skin (characteristic 17)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

# 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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo‑qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

|  |  |
| --- | --- |
| State | Note |
| small | 3 |
| medium | 5 |
| large | 7 |

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

|  |  |
| --- | --- |
| State | Note |
| very small | 1 |
| very small to small | 2 |
| small | 3 |
| small to medium | 4 |
| medium | 5 |
| medium to large | 6 |
| large | 7 |
| large to very large | 8 |
| very large | 9 |

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

## 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, VS – see Chapter 4.1.5

(a)-(b) 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 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (\*) (+) | **VG/MS** | **Plant: length of main stem** | **Plante : longueur de la tige principale** | **Pflanze: Länge des Hauptstiels** | **Planta: longitud del tallo principal** |  |  |
| **QN** | **(a)** | short | courte | kurz | corto |  | 3 |
|  |  | medium | moyenne | mittel | medio | Tetsukabuto AG 90 | 5 |
|  |  | long | longue | lang | largo | Zadok | 7 |
|  | **VG** | **Leaf blade: size** | **Limbe : taille** | **Blattspreite: Größe** | **Limbo: tamaño** |  |  |
| **QN** | **(a)** | small | petite | klein | pequeño | Kazako | 3 |
|  |  | medium | moyenne | mittel | medio | Strong Tosa | 5 |
|  |  | large | grande | groß | grande | Shintosa | 7 |
| **(\*) (+)** | **VG** | **Leaf blade: incisions** | **Limbe : incisions** | **Blattspreite: Einschnitte** | **Limbo: incisiones** |  |  |
| **QN** | **(a)** | absent or very weak | absentes ou très peu profondes | fehlend oder sehr schwach | nulas o muy leves |  | 1 |
|  |  | weak | peu profondes | schwach | leves |  | 2 |
|  |  | medium or strong | moyennes ou profondes | mittel oder stark | moderadas o profundas |  | 3 |
|  | **VG** | **Leaf blade: intensity of green color of upper side** | **Limbe : intensité de la couleur verte de la face supérieure** | **Blattspreite: Intensität der Grünfärbung der Oberseite** | **Limbo: intensidad del color verde del haz** |  |  |
| **QN** | **(a)** | light | claire | hell | claro |  | 3 |
|  |  | medium | moyenne | mittel | medio | Kazako | 5 |
|  |  | dark | foncée | dunkel | oscuro | Azman, Zadok | 7 |
|  | **VG** | **Leaf blade: silver patches** | **Limbe : taches argentées** | **Blattspreite: Silberflecken** | **Limbo: manchas plateadas** |  |  |
| **QN** | **(a)** | absent or very weak | absentes ou très faibles | fehlend oder sehr schwach | ausentes o muy débiles | Strong Tosa | 1 |
|  |  | weak | faibles | schwach | débiles | Zadok | 2 |
|  |  | medium | moyennes | mittel | medias |  | 3 |
|  | **VG** | **Petiole: length** | **Pétiole longueur** | **Blattstiel: Länge** | **Pecíolo: longitud** |  |  |
| **QN** | **(a)** | short | court | kurz | corto |  | 3 |
|  |  | medium | moyen | mittel | medio | Azman | 5 |
|  |  | long | long | lang | largo | Carnivor | 7 |
|  | **VG** | **Peduncle: length** | **Pédoncule : longueur** | **Blütenstiel: Länge** | **Pedúnculo: longitud** |  |  |
| **QN** | **(a)** | short | court | kurz | corto | Zadok | 3 |
|  |  | medium | moyen | mittel | medio | Kazako | 5 |
|  |  | long | long | lang | largo | Strong Tosa | 7 |
|  | **VG** | **Peduncle: diameter** | **Pédoncule : diamètre** | **Blütenstiel: Durchmesser** | **Pedúnculo: diámetro** |  |  |
| **QN** | **(b)** | small | petit | klein | pequeño | Kazako | 3 |
|  |  | medium | moyen | mittel | medio | Azman, Maciste, Shintiak | 5 |
|  |  | large | grand | groß | grande | Shintosa, Strong Tosa | 7 |
| **(\*) (+)** | **VG** | **Fruit: shape** | **Fruit : forme** | **Frucht: Form** | **Fruto: forma** |  |  |
| **PQ** | **(b)** | obovate | obovale | verkehrt eiförmig | oboval | Flexifort | 1 |
|  |  | oblate | aplati | breitrund | achatada | Carnivor, Kazako, Kublai | 2 |
|  |  | round | arrondi | rund | redonda | Shintosa | 3 |
| **(\*)** | **MG/VG** | **Fruit: length** | **Fruit : longueur** | **Frucht: Länge** | **Fruto: longitud** |  |  |
| **QN** | **(b)** | short | court | kurz | corto | Shintosa | 3 |
|  |  | medium | moyen | mittel | medio | TZ148 | 5 |
|  |  | long | long | lang | largo | Flexifort | 7 |
| **(\*) (+)** | **MG/VG** | **Fruit: diameter** | **Fruit : diamètre** | **Frucht: Durchmesser** | **Fruto: diámetro** |  |  |
| **QN** | **(b)** | small | petit | klein | pequeño | Kazako, Shintosa | 3 |
|  |  | medium | moyen | mittel | medio | Flexifort | 5 |
|  |  | large | grand | groß | grande | Zadok, TZ148 | 7 |
| **(+)** | **MG/VG** | **Fruit: ratio length/diameter** | **Fruit : rapport longueur/ diamètre** | **Frucht: Verhältnis Länge/Durchmesser** | **Fruto: relación longitud/diámetro** |  |  |
| **QN** | **(b)** | very low | très petit | sehr klein | muy baja |  | 1 |
|  |  | low | petit | klein | baja |  | 3 |
|  |  | medium | moyen | mittel | media |  | 5 |
|  |  | high | grand | groß | alta |  | 7 |
|  |  | very high | très grand | sehr groß | muy alta |  | 9 |
| **(\*) (+)** | **VG** | **Fruit: profile at stem end** | **Fruit : profil à la base** | **Frucht: Profil am Stielende** | **Fruto: perfil en la base** |  |  |
| **QN** | **(b)** | raised | protubérant | vorgewölbt | elevado | Extra, Flexifort | 1 |
|  |  | flat | plan | flach | plano | Azman, Shintosa | 2 |
|  |  | depressed | déprimé | eingesenkt | deprimido | Kazako | 3 |
| **(+)** | **VG** | **Fruit: profile at blossom end** | **Fruit : profil au sommet** | **Frucht: Profil am apikalen Teil** | **Fruto: perfil en el ápice** |  |  |
| **QN** | **(b)** | depressed | déprimé | eingesenkt | deprimido | Azman, Kazako | 1 |
|  |  | flat | plan | flach | plano | Carnivor, Ercole | 2 |
|  |  | raised | protubérant | vorgewölbt | elevado | Flexifort | 3 |
|  | **VG** | **Fruit: depth of grooves** | **Fruit :** **profondeur des cannelures** | **Frucht: Tiefe der Furchen** | **Fruto: profundidad de los surcos** |  |  |
| **QN** | **(b)** | shallow | peu profondes | flach | poco profundos | Carnivor | 3 |
|  |  | medium | moyennement profondes | mittel | medios | Kazako, Kublai | 5 |
|  |  | deep | profondes | tief | profundos | Ercole | 7 |
| **(+)** | **VG** | **Fruit: type of surface** | **Fruit : type de surface** | **Frucht: Oberflächentyp** | **Fruto: tipo de superficie** |  |  |
| **QN** | **(b)** | smooth | lisse | glatt | lisa | Kazako | 1 |
|  |  | slightly rough | légèrement rugueuse | leicht rauh | rugosa | Zadok | 2 |
|  |  | moderately rough | modérément rugueuse | mäßig rauh | moderadamente rugosa | Azman, Carnivor,  Strong Tosa | 3 |
|  |  | very rough | très rugueuse | sehr rauh | muy rugosa | Super Shintosa | 4 |
| **(\*)** | **VG** | **Fruit: ground color of skin** | **Fruit : couleur de fond de l’épiderme** | **Frucht: Grundfarbe der Schale** | **Fruto: color de fondo de la epidermis** |  |  |
| **QL** | **(b)** | orange | orange | orange | naranja | Kazako | 1 |
|  |  | green | vert | grün | verde | Ercole, Extra, Shintosa, Zadok | 2 |
|  | **VG** | **Fruit: intensity of ground color** | **Fruit : intensité de la couleur du fond de l’épiderme** | **Frucht:** **Intensität der Grundfarbe** | **Fruto: intensidad del color de fondo** |  |  |
| **QN** | **(b)** | very light | très claire | sehr hell | muy claro | Zadok | 1 |
|  |  | light | claire | hell | claro |  | 3 |
|  |  | medium | moyenne | mittel | medio |  | 5 |
|  |  | dark | foncée | dunkel | oscuro | Shintosa | 7 |
|  |  | very dark | très foncée | sehr dunkel | muy oscuro | Just | 9 |
| **(+)** | **VG** | **Fruit: density of blotches** | **Fruit : densité des taches** | **Frucht: Dichte der Flecken** | **Fruto: densidad de manchas** |  |  |
| **QN** | **(b)** | none | nulle | keine | ausentes | Kasako | 1 |
|  |  | sparse | faible | locker | laxa | Just | 3 |
|  |  | medium | moyenne | mittel | media | Shintosa | 5 |
|  |  | dense | dense | dicht | densa | TZ148 | 7 |
|  | **VG** | **Fruit: intensity of yellow color of flesh** | **Fruit : intensité de la couleur jaune de la chair** | **Frucht: Intensität der Gelbfärbung des Fleisches** | **Fruto: intensidad del color amarillo de la pulpa** |  |  |
| **QN** | **(b)** | light | claire | hell | claro |  | 1 |
|  |  | medium | moyenne | mittel | medio |  | 2 |
|  |  | dark | foncée | dunkel | oscuro |  | 3 |

# 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) Observations should be made on fully developed leaves, after the beginning of flowering.

(b) Observations should be made on fully developed fruit before the color change at over maturity.

8.2 Explanations for individual characteristics

Ad. 1: Plant: length of main stem

Plants tend to develop many branches. The length of the main stem is correlated to the volume of the plant, the surface covered by the plant in the field, the growth speed of the stems.

This characteristic could be assessed by comparisons between the plants of the same variety. When plants are spaced with the same distance between plants, it is possible to identify a variety which grows faster than another.

Ad. 3: Leaf blade: incisions

|  |  |  |
| --- | --- | --- |
| Ad | Ad | Ad |
| 1 | 2 | 3 |
| absent or very weak | weak | medium or strong |

Ad. 9: Fruit: shape

Ad. 12: Fruit: ratio length/diameter

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | 🡨 broadest part 🡪 | | |
|  |  | (below middle) | at middle | |
|  |  |  |  |  |
| broad (*low)* 🡨 width (ratio length/width) 🡪 narrow (*high*) |  |  |  | |
|  | 1 |  | |
|  | obovate |  | |
|  |  |  | |
|  |  | 3 | |
|  |  | round | |
|  |  | ad 19 - 2 | |
|  |  | 2 | |
|  |  | oblate | |

Ad. 11: Fruit: diameter

This assessment is based on the widest part of the fruit.

Ad. 13: Fruit: profile at stem end

|  |  |  |
| --- | --- | --- |
|  | new-28-2 | car29-2 |
| 1 | 2 | 3 |
| raised | flat | depressed |

Ad. 14: Fruit: profile at blossom end

|  |  |  |
| --- | --- | --- |
|  | c-mosch-Ad 25 | car28-3 |
| 1 | 2 | 3 |
| depressed | flat | raised |

Ad. 16: Fruit: type of surface

|  |  |  |  |
| --- | --- | --- | --- |
| C:\Users\jouyc\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\AD.16-1.png | C:\Users\jouyc\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\Ad.16-2.png | C:\Users\jouyc\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\Ad.16-3.png | C:\Users\jouyc\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\Ad16-4.png |
| 1 | 2 | 3 | 4 |
| smooth | slightly rough | moderately rough | very rough |

Ad. 19: Fruit: density of blotches

|  |  |  |  |
| --- | --- | --- | --- |
| C:\Users\jouyc\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\Ad19.1.png |  |  |  |
| 1 | 3 | 5 | 7 |
| none | sparse | medium | dense |

8.3 Other Names of the Example Varieties

|  |  |
| --- | --- |
| Shintosa (1) | Shintoza, Tetsukabuto (2) |

(1) is the official denomination registrated under the previous law in Japan in 1951.

(2) is the former name of Shintosa, it corresponds to a type more than to a variety.

# Literature

Bemis, W. P., Nelson, J. M., 1963: Interspecific Hybridization within the Genus *Cucurbita* I, Fruit Set, Seed and Embryo Development. Journal of the Arizona Academy of Science. Vol. 2, No. 3 (Feb., 1963), US, pp. 104 to 107 <http://www.jstor.org/discover/10.2307/27641796?uid=3738016&uid=2134&uid=2&uid=70&uid=4&sid=21104025963677>

Ivančič, A., Šiško, M., Bohanec B., Šiftar, S., 2004: Morpho-agronomic characteristics of the interspecific hybrid *Cucurbita ficifolia* × *C. maxima.* Agricultura Scientific Journal - University of Maribor, Issue 03, SI, pp. 1 to 5

<http://www.agricultura-online.com/portal/issues/issue-3/64-morpho-agronomic-characteristics-of-the-interspecific-hybrid-cucurbita-ficifolia-t-c-maxima>

Karaağaç O., Balkaya A., 2013: [Interspecific hybridization and hybrid seed yield of winter squash (*Cucurbita maxima* Duch.) and pumpkin (*Cucurbita moschata* Duch.) lines for rootstock breeding](http://www.sciencedirect.com/science/article/pii/S0304423812005079), *Scientia Horticulturae*, Volume 149, 4 January 2013, pp. 9 to 12

<http://www.sciencedirect.com/science/article/pii/S0304423812005079>

Keinath A., P., 2013: Susceptibility of Cucurbit Rootstocks to *Didymella bryoniae* and Control of Gummy Stem Blight on Grafted Watermelon Seedlings with Fungicides. APS Journal, Volume 97, Number 8, US, pp. 1018 to 1024

<http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-12-12-1133-RE?journalCode=pdis>

Keinath, A. P., Hassell, R. L., 2014: Control of Fusarium Wilt of Watermelon by Grafting onto Bottle gourd or Interspecific Hybrid Squash Despite Colonization of Rootstocks by Fusarium. Plant Disease, February 2014, Volume 98, Number 2, US, pp. 255 to 266

<http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-01-13-0100-RE>

Rakha, M.T., Metwally, E.I., Moustafa, S.A., Etman, A.A., Dewir, Y.H., 2012: Evaluation of regenerated trains from six *Cucurbita* interspecific hybrids obtained through anther and ovule *in vitro* cultures. Australian Journal of Crop Science, 6(1), AU, pp. 23 to 30

<http://www.cropj.com/dewir_6_1_2012_23_30.pdf>

Rakha M.T., Metwally E.I., Moustafa S.A., Etman A.A., Dewir Y.H., 2012: Production of Cucurbita interspecific hybrids through cross pollination and embryo rescue technique.World Applied Sciences Journal 20 (10): pp 1366 to 1370

<http://www.idosi.org/wasj/wasj20(10)12/9.pdf>

Sarowar, S., Oh, H.Y., Hyung, N.I., Min, B.W., Harn, C.H., Yang, S.K., Ok, S.H., Shin, J.S., 2002: In vitro micropropagation of a Cucurbita interspecific hybrid cultivar – a root stock plant. Plant Cell, Tissue and Organ Culture 75, KR, pp. 179 to 182

<http://biotech.korea.ac.kr/lab/jsshin/PDF/plantcellorgan(sujon2003).pdf>

Uretsky, Jacob, M.S., 2012: Development and evaluation of interspecific *Cucurbita maxima* x *Cucurbita moschata* hybrids for processing squash. University of New Hamphire, Thesis report, US, 116 pp.

<http://gradworks.umi.com/15/18/1518016.html>

Zhang, Q., Yu,E., Medina, A., 2012: Development of Advanced Interspecific-bridge Lines among *Cucurbita pepo*, *C. maxima,* and *C. moschata*. HortScience April 2012 47, US, pp. 452 to 458

<http://hortsci.ashspublications.org/content/47/4/452.abstract>

# 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 | | | *Cucurbita maxima* Duch. X *Cucurbita moschata* Duch. | | | | | |  | | |
|  | | |  | | | | | |  | | |
| 1.2 Common name | | |  | | | | | |  | | |
|  | | |  | | | | | | |  | |
|  | | |  | | | | | |  | | |
| 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 | | |  | | | | | |  | | |
|  | | |  | | | | | |  | | |
| [[2]](#footnote-2)#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)  (…………………..……………..…) x (……………..…………………..…)  Species of female parent Species of male parent  (b) partially known cross [ ]  (please state known parent variety(ies))  (…………………..……………..…) x (……………..…………………..…)  Species of female parent Species of male parent  (c) unknown cross [ ]  4.1.2 Mutation [ ]  (please state parent variety)     |  | | --- | |  |   4.1.3 Discovery and development [ ]  (please state where and when discovered and how developed)   |  | | --- | |  |   4.1.4 Other [ ]  (please provide details)   |  | | --- | |  | | | | | | | | | | | | |
| 4.2 Method of propagating the variety (hybrid)  4.2.1 Seed-propagated varieties […]  4.2.2 Vegetatively propagated varieties [...]  4.2.3 Other […]  (please provide details)   |  | | --- | |  | | | | | | | | | | | | |
| 5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds). | | | | | | | | | | | |
|  | Characteristics | | | | | | Example Varieties | | | | Note |
| **5.1 (1)** | **Plant: length of main stem** | | | | | |  | | | |  |
|  | very short | | | | | |  | | | | 1 [ ] |
|  | very short to short | | | | | |  | | | | 2 [ ] |
|  | short | | | | | |  | | | | 3 [ ] |
|  | short to medium | | | | | |  | | | | 4 [ ] |
|  | medium | | | | | | Tetsukabuto AG 90 | | | | 5 [ ] |
|  | medium to long | | | | | |  | | | | 6 [ ] |
|  | long | | | | | | Zadok | | | | 7 [ ] |
|  | long to very long | | | | | |  | | | | 8 [ ] |
|  | very long | | | | | |  | | | | 9 [ ] |
| **5.2 (3)** | **Leaf blade: incisions** | | | | | |  | | | |  |
|  | absent or very weak | | | | | |  | | | | 1 [ ] |
|  | weak | | | | | |  | | | | 2 [ ] |
|  | medium or strong | | | | | |  | | | | 3 [ ] |
| **5.3 (9)** | **Fruit: shape** | | | | | |  | | | |  |
|  | obovate | | | | | | Flexifort | | | | 1 [ ] |
|  | oblate | | | | | | Carnivor, Kazako, Kublai | | | | 2 [ ] |
|  | round | | | | | | Shintosa | | | | 3 [ ] |
| **5.4 (13)** | **Fruit: profile at stem end** | | | | | |  | | | |  |
|  | raised | | | | | | Extra, Flexifort | | | | 1 [ ] |
|  | flat | | | | | | Azman, Shintosa | | | | 2 [ ] |
|  | depressed | | | | | | Kazako | | | | 3 [ ] |
| **5.5 (20)** | **Fruit: intensity of yellow color of flesh** | | | | | |  | | | |  |
|  | light | | | | | |  | | | | 1 [ ] |
|  | medium | | | | | |  | | | | 2 [ ] |
|  | dark | | | | | |  | | | | 3 [ ] |
| 6. Similar varieties and differences from these varieties  *Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.* | | | | | | | | | | | |
| Denomination(s) of variety(ies) similar to your candidate variety | | Characteristic(s) in which your candidate variety differs from the similar variety(ies) | | | Describe the expression of the characteristic(s) for the **similar** variety(ies) | | | Describe the expression of the characteristic(s) for **your** candidate variety | | | |
| *Example* | | *Fruit: depth of grooves* | | | *shallow* | | | *medium* | | | |
| *To include* | |  | | |  | | |  | | | |
|  | |  | | |  | | |  | | | |
|  | |  | | |  | | |  | | | |
| Comments: | | | | | | | | | | | |
| [[3]](#footnote-3)#7. Additional information which may help in the examination of the variety  7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?  Yes [ ] No [ ]  (If yes, please provide details)  7.2 Are there any special conditions for growing the variety or conducting the examination?  Yes [ ] No [ ]  (If yes, please provide details)  7.3 Other information  Variety use  (a) vegetable [ ]  (b) rootstock [ ]  (c) other: (please provide details) [ ]   |  | | --- | |  |   A representative color image of the fruit at full development 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. # Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire. [↑](#footnote-ref-2)
3. # Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire. [↑](#footnote-ref-3)