



TG/311/1

ORIGINAL: English

DATE: 2015-03-25

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

Cucurbita maxima x Cucurbita moschata

UPOV Code: CUCUR_MMO

Cucurbita maxima Duch. x *Cucurbita moschata* Duch.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Cucurbita maxima</i> Duch. x <i>Cucurbita moschata</i> Duch.	<i>Cucurbita maxima</i> x <i>Cucurbita moschata</i>	<i>Cucurbita maxima</i> x <i>Cucurbita moschata</i>	<i>Cucurbita maxima</i> x <i>Cucurbita moschata</i>	<i>Cucurbita maxima</i> x <i>Cucurbita moschata</i>

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.

* 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.]

TABLE OF CONTENTS

PAGE

1. SUBJECT OF THESE TEST GUIDELINES.....	3
2. MATERIAL REQUIRED.....	3
3. METHOD OF EXAMINATION	3
3.1 NUMBER OF GROWING CYCLES	3
3.2 TESTING PLACE	3
3.3 CONDITIONS FOR CONDUCTING THE EXAMINATION	3
3.4 TEST DESIGN	3
3.5 ADDITIONAL TESTS.....	3
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 DISTINCTNESS	4
4.2 UNIFORMITY	5
4.3 STABILITY.....	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS.....	5
6.1 CATEGORIES OF CHARACTERISTICS	5
6.2 STATES OF EXPRESSION AND CORRESPONDING NOTES	6
6.3 TYPES OF EXPRESSION	6
6.4 EXAMPLE VARIETIES.....	6
6.5 LEGEND	7
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES	8
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS.....	11
8.1 EXPLANATIONS COVERING SEVERAL CHARACTERISTICS	11
8.2 EXPLANATIONS FOR INDIVIDUAL CHARACTERISTICS	11
8.3 OTHER NAMES OF THE EXAMPLE VARIETIES	13
9. LITERATURE	14
10. TECHNICAL QUESTIONNAIRE.....	15

1. Subject of these Test Guidelines

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

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seeds.

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

200g or 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.

3. Method of Examination

3.1 *Number of Growing Cycles*

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

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

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

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 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.

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.1.4 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 of hybrid varieties, a population standard of 1% 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 In case of single-cross hybrids, an additional tolerance of off-types can be accepted for clear cases of plants obviously resulting from the selfing of a parent line. An additional population standard of 3% and an acceptance probability of at least 95% should be applied for 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.

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Plant: length of main stem (characteristic 1)
- (b) Leaf blade: incisions (characteristic 3)
- (c) Fruit: shape (characteristic 9)
- (d) Fruit: profile at stem end (characteristic 13)
- (e) 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".

6. Introduction to the Table of Characteristics

6.1 *Categories of Characteristics*

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 States of Expression and Corresponding Notes

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.

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

	English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	VG/MS	Plant: length of main stem	Plante : longueur de la tige principale	Pflanze: Länge des Haupttriebes	Planta: longitud del tallo principal	
QN	(a)	short	courte	kurz	corto	3
		medium	moyenne	mittel	medio	Tetsukabuto AG 90
		long	longue	lang	largo	Zadok
2.	VG	Leaf blade: size	Limbe : taille	Blattspreite: Größe	Limbo: tamaño	
QN	(a)	small	petite	klein	pequeño	Kazako
		medium	moyenne	mittel	medio	Strong Tosa
		large	grande	groß	grande	Shintosa
3.	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
4.	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
		dark	foncée	dunkel	oscuro	Azman, Zadok
5.	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
		weak	faibles	schwach	débiles	Zadok
		medium	moyennes	mittel	medias	3
		strong	fortes	stark	fuertes	4
		very strong	très fortes	sehr stark	muy fuertes	5
6.	VG	Petiole: length	Pétiole longueur	Blattstiel: Länge	Pecíolo: longitud	
QN	(a)	short	court	kurz	corto	3
		medium	moyen	mittel	medio	Azman
		long	long	lang	largo	Carnivor
7.	VG	Peduncle: length	Pédoncule : longueur	Blütenstiel: Länge	Pedúnculo: longitud	
QN	(b)	short	court	kurz	corto	Zadok
		medium	moyen	mittel	medio	Kazako
		long	long	lang	largo	Strong Tosa

	English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
8.	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
9.	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
10.	MS/ 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
11.	MS/ 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
12.	MS/ 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
13.	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
14.	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

	English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
15.	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
16.	VG	Fruit: surface	Fruit : surface	Frucht: Oberfläche	Fruto: 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
17.	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
18.	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
19.	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
20.	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

8. 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.

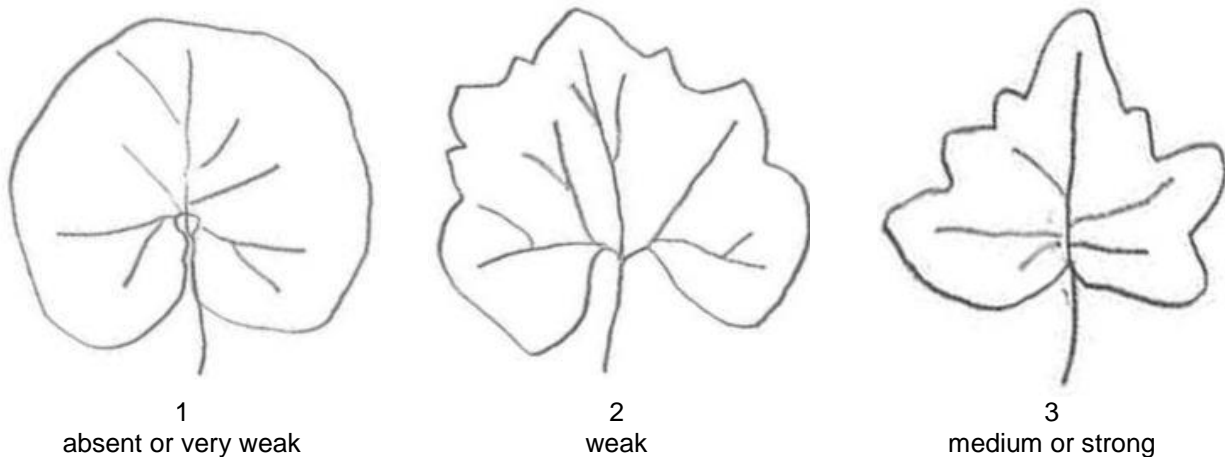
8.2 *Explanations for individual characteristics*

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.

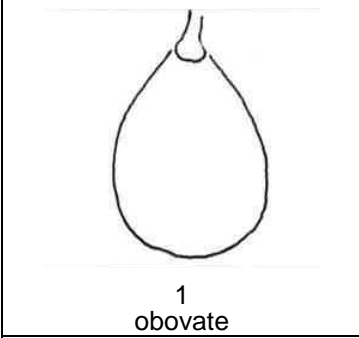

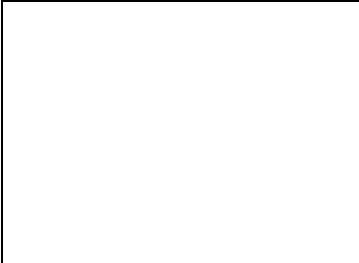
This characteristic could be assessed by comparisons between the plants of the same variety. When plants are spaced with the same distance between plants, it is possible to identify a variety which grows faster than another.

Ad. 3: Leaf blade: incisions



Ad. 9: Fruit: shape

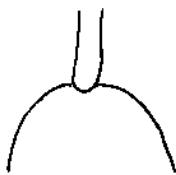
Ad. 12: Fruit: ratio length/diameter

		← broadest part →	
		below middle	at middle
narrow (high) ↑ width (ratio length/diameter) ↓ broad (low)	 1 obovate		
		 3 round	
		 2 oblate	

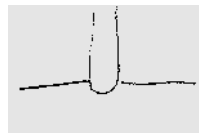
Ad. 11: Fruit: diameter

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

Ad. 13: Fruit: profile at stem end



1
 raised



2
 flat

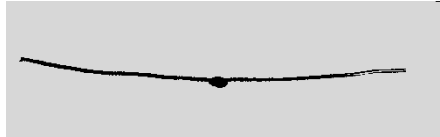


3
 depressed

Ad. 14: Fruit: profile at blossom end



1
depressed



2
flat



3
raised

Ad. 16: Fruit: surface



1
smooth



2
slightly rough



3
moderately rough



4
very rough

Ad. 19: Fruit: density of blotches



1
none



3
sparse



5
medium



7
dense

8.3 *Other Names of the Example Varieties*

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

- (1) official denomination registered under the previous law in Japan in 1951.
 (2) former name of Shintosa, which corresponds to a type than to the variety.

9. 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* x *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, *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 strains 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](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](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 Hampshire, 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>

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Cucurbita maxima Duch. x Cucurbita moschata Duch."/>	
1.2 Common name	<input type="text"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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

#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)

.....

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

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

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 Plant: length of main stem (1)		
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 Leaf blade: incisions (3)		
absent or very weak		1 []
weak		2 []
medium or strong		3 []
5.3 Fruit: shape (9)		
obovate	Flexifort	1 []
oblate	Carnivor, Kazako, Kublai	2 []
round	Shintosa	3 []
5.4 Fruit: profile at stem end (13)		
raised	Extra, Flexifort	1 []
flat	Azman, Shintosa	2 []
depressed	Kazako	3 []
5.5 Fruit: ground color of skin (17)		
orange	Kazako	1 []
green	Ercole, Extra, Shintosa, Zadok	2 []
5.6 Fruit: intensity of yellow color of flesh (20)		
light		1 []
medium		2 []
dark		3 []

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

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
<i>Example</i>	<i>Fruit: depth of grooves</i>	<i>shallow</i>	<i>medium</i>

Comments:

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

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

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

Yes No

(If yes, please provide details)

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

Yes No

(If yes, please provide details)

7.3 Other information

Variety use

- | | | |
|-----|---------------------------------|--------------------------|
| (a) | vegetable | <input type="checkbox"/> |
| (b) | rootstock | <input type="checkbox"/> |
| (c) | other: (please provide details) | <input type="checkbox"/> |

7.4 A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (<http://www.upov.int/tgp/en/>).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

8. Authorization for release

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

Yes No

(b) Has such authorization been obtained?

Yes No

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

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

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

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

- | | | |
|-----------------------------------------------------------|---------|--------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma) | Yes [] | No [] |
| (b) Chemical treatment (e.g. growth retardant, pesticide) | Yes [] | No [] |
| (c) Tissue culture | Yes [] | No [] |
| (d) Other factors | Yes [] | No [] |

Please provide details for where you have indicated "yes".

.....

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

Applicant's name

Signature

Date

[End of document]