

TG/PEPPER ORIGINAL: English DATE: 2013-07-03

EAST ASIA PLANT VARIETY PROTECTION FORUM

PEPPER

(Capsicum annuum L.)

# GUIDELINES

# FOR THE CONDUCT OF TESTS

# FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:

Botanical name	English		
Capsicum annuum L.	Sweet Pepper, Hot Pepper, Paprika, Chili		

The purpose of these guidelines ("Test Guidelines") is to fulfill the activities under the EAPVP Forum on harmonization of Test Guidelines.

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### 1. <u>Subject of these Test Guidelines</u>

These Test Guidelines apply to all varieties of Capsicum annuum L.

### 2. <u>Material Required</u>

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:

### 2,500 seeds.

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

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

2.6 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. <u>Method of Examination</u>

### 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*

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

3.3.2 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 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 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.

### 4. <u>Assessment of Distinctness, Uniformity and Stability</u>

### 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 UPOV document TG/1/3 "General Introduction" prior to making decisions regarding distinctness.

## 4.2 Uniformity

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

4.2.2 For the assessment of uniformity of cross-pollinated varieties, a population standard of 2% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, 2 off-types are allowed.

4.2.3 For the assessment of uniformity of hybrids, 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.

### 5. <u>Grouping of Varieties and Organization of the Growing Trial</u>

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) Seedling: anthocyanin coloration of hypocotyl (characteristic 1)
- (b) Plant: shortened internode (in upper part) (characteristic 4)
- (c) Fruit: color (<u>before</u> maturity) (characteristic 21)
- (d) Fruit: attitude (characteristic 24)
- (e) Fruit: shape in longitudinal section (characteristic 28)
- (f) Fruit: color (<u>at</u> maturity) (characteristic 33)
- (g) Fruit: capsaicin in placenta (characteristic 45)
- (h) Resistance to Tobamovirus Pathotype 0 (Tobacco MosaicVirus (0)) (characteristic 48.1)
- (i) Resistance to Tobamovirus Pathotype 1-2 (Tomato MosaicVirus (1-2)) (characteristic 48.2)

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- (j) Resistance to Tobamovirus Pathotype 1-2-3 (Pepper Mild Mottle Virus (1-2-3)) (characteristic 48.3)
- (k) Resistance to Potato Virus Y (PVY) Pathotype 0 (characteristic 49.1)

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

### 6. <u>Introduction to the Table of Characteristics</u>

### 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 East Asia PVP Forum 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 UPOV document TG/1/3 "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 3.3.2

- (a) and (b) See Explanations on the Table of Characteristics in Chapter 8.1
- (+) See Explanations on the Table of Characteristics in Chapter 8.2

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## 7. <u>Table of Characteristics</u>

UPOV	EAPVP		Characteristics	Expression	Example Varieties	Not
1. (*) (+)	1	VG	Seedling: anthocyanin coloration of hypocotyl	absent present	Laris (INA) IPB Ungara (INA)	1 9
QL 2. (+)	2	VG	Plant: habit	upright	IPB C9 (INA), Bara, CT01P	1
QN				semi-upright	(MAS) Krisna (INA), Green Eagle 223	2
				prostrate	(MAS) Tanjung 2 (INA)	3
3.	3	VG	Plant : length of stem	short	IPB Perisai (INA),	3
(+) QN				medium	CT01P (MAS) Seloka IPB (INA), MC11 (MAS)	5
				long	TM999 (INA)	7
4. (*)	4	VG	Plant: shortened internode (in upper part)	absent	Tombak (INA), CT01P, MC11 (MAS)	1
(+) QL				present	(MAS) IPB 92(INA)	9
5. (+)	5	MS	<b>Varieties with shortened internode only:</b> Plant: number of internodes between the	none one to three	-	1 2
QN			first flower and shortened internodes	more than three	IPB 92 (INA)	3
6. QN	6	MS/VG	Varieties without shortened internode: Plant: length of internode (on the first branching of the main axis)	short medium	- IPB Perisai (INA) Hot Beauty(INA), CT01P, MC11 (MAS), Bara Krida 9 (INA)	3 5
				long	-	7
7.	7	VG	Plant: anthocyanin coloration of nodes	very long absent	Green Eagle 223	9
(+) QL	,		rant. antiocyanni coloration of nodes	present	(MAS) IPB Ungara (INA), Bara, CT01P, MC11 (MAS)	9
8.	8	VG	Stem: intensity of anthocyanin	very weak		1
(+) QN			coloration of nodes	weak		3
				medium	IPB 9, Tanjung 1 (INA), CT01P, MC11 (MAS)	<mark>5</mark>
				strong	IPB Ungara (INA)	7
				very strong		<mark>9</mark>
9. (+) QN	9	VG	Stem: hairiness of nodes	absent or very weak	Tanjung 2 (INA), CT01P, MC11 (MAS)	1
				weak medium strong	Jatilaba (INA) IPB Perisai (INA) IPB Ungara (INA)	3 5 7
				very strong		9
10. (+)	10	VG/MS	Plant: height	very short short	Tanjung 2(INA) Jatilaba (INA)	1 3
QN				medium tall very tall	IPB CH3 (INA) Biola (INA) Krida 9 (INA)	5 7 9
11. QN	11	MS/ VG	Leaf : length of blade	very short short	- Genie (INA)	1

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			- 9 -			
				long very long	Bara, CT01P, MC11 (MAS) Tanamo (INA) Edison (INA)	7 9
12. QN	12	MS/ VG	Leaf : width of blade	very narrow narrow medium	- Kopay (INA) IPB CH3 (INA), Bara, CT01P, MC11 (MAS)	1 3 5
				broad very broad	Tombak (INA) Suniya (INA)	7 9
13. QN	13	VG	Leaf : intensity of green color	very light light medium	SG Hot 99 (INA) Genie (INA) TM 999 (INA), CT01P, MC11 (MAS)	1 3 5
				dark very dark	Tanjung 1 (INA) IPB Ungara (INA)	7 9
(+) QL	14	VG	Leaf: anthocyanin coloration	absent present	Bara, CT01P, MC11 (MAS) IPB Ungara (INA)	1 9
14. (+) PQ	15	VG	Leaf: shape	Lanceolate	TM 999 (INA), Bara, CT01P, MC11 (MAS) IPB Perisai (INA)	1 2
15. (+) QN	16	VG	Leaf: undulation of margin	broad elliptic very weak weak	- Genie (INA), CT01P, MC11 (MAS) Gada (INA)	3 1 3
				medium strong very strong	- Krida 9 (INA) -	5 7 9
16. <mark>(+)</mark> QN	17	VG	Leaf : blistering	absent or very weak weak medium strong very strong	TM 888 (INA), CT01P, MC11 (MAS) IPB Perisai (INA) - - -	1 3 5 7 9
17. (+) QN	18	VG	Leaf: profile in cross section	strongly concave moderatly concave flat	IPB CH3 (INA) Kresna (INA), CT01P, MC11 (MAS) Biola (INA)	1 3 5
				moderatly convex strongly convex	-	7 9
18. QN	19	VG	Leaf: glossiness	absent or very weak	IPB Perisai (INA), CT01P, MC11 (MAS)	1
				weak medium strong very strong	- IPB Perbani (INA) - -	3 5 7 9
19. (*) (+) QN	20	VG	Flower: peduncle attitude	erect semi-drooping drooping	Bara - Tanjung 2 (INA), CT01P, MC11 (MAS)	1 2 3
<mark>(+)</mark> PQ	21	VG	Flower: stigma exsertion	below same level above	IPB Perisai (INA) IPB Perisai (INA) Adipati (INA)	1 2 3
20. (+) QL	22	VG	Flower: anthocyanin coloration in anther	absent present	- IPB Ungara (INA), CT01P, MC11 (MAS)	1 9
(+) QL	23	VG	Flower: : anthocyanin coloration in filament	absent present	Tanjung 1 (INA), MC 11 (MAS) IPB Ungara (INA),	<mark>1</mark> 9

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		-	- 10 -			
					CT01P, Green Eagle 223 (MAS)	
(+) QL	24	VG	Flower: secondary color of corolla	absent at margin at base at margin and base	Adipati - IPB Ungara IPB C4	1 2 3 4
21. (*) (+) PQ	25	VG (a)	Fruit: color before maturity	greenish white yellow green	Solok (MAS), Bianca (INA) - Tanamo (INA), CT01P, MC11 (MAS)	1 2 3
				purple	IPB Ungara (INA)	4
22. QN	26	VG (a)	Fruit: intensity of color before maturity	very light light medium dark	IPB C9 (INA), Solok (MAS) Bara Tanjung 2 (INA), CT01P (MAS) Tanamo (INA), Green Eagle 223 (MAS)	1 3 5 7
				very dark	IPB Ungara (INA)	9
23. (+) QL	27	VG (a)	Fruit: anthocyanin coloration	absent present	Genie (INA), CT01P, MC11 (MAS) IPB Ungara (INA)	1 9
24. (*) (+) QN	28	VG (b)	Fruit: attitude	erect horizontal drooping	Bara - Kopay (INA), CT01P, MC11 (MAS)	1 2 3
25. (+) QN	29	VG/MS (b)	Fruit: length	very short short medium long very long	Bara IPB C9 (INA) TM 888 (INA) Tanamo (INA), CT01P, MC11 (MAS) Kopay (INA)	1 3 5 7 9
26. QN	30	VG/MS (b)	Fruit: diameter	very narrow narrow medium	SG Hot 99 (INA) TM 888 (INA), Bara Tombak (INA), CT01P, MC11	1 3 5
				broad very broad	(MAS) Bianca (INA), Solok (MAS) Edison (INA)	7 9
27. (*) QN	31	MS (b)	Fruit: ratio length/diameter	very small small medium large very large	Edison (INA) Bianca (INA) Tombak (INA) SG Hot 99 (INA) Kopay (INA)	1 3 5 7 9
28 (*) (+) PQ	32	VG (b)	Fruit: shape in longitudinal section	oblate circular cordate square rectangular trapezoidal moderately triangular narrowly triangular hornshaped	- - IPB Ungara (INA) Edison (INA) - Bianca (INA) Genie (INA), Solok (MAS) Bara IPB Perisai (INA), MC11 (MAS) Tombak (INA), CT01P, Green Eagle 223 (MAS)	1 2 3 4 5 6 7 8 9 10
<mark>(+)</mark>	<mark>33</mark>	<mark>VG</mark>	Fruit: twisting	Absent Present	Tombak Kopay	1 9

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29.     34     VG (b)     Pruit: shape in cross section (at level of placenta)     Elliptic creature     Koda 9 (NA), angular creature     1.       30.     35     VG (b)     Inut: sinuation of pericarp at based purt     absent or very vessk     PP Ungara (NA), BP Perissi (NA)     1.       30.     35     VG (b)     Inut: sinuation of pericarp at based purt     absent or very vessk     PP Ungara (NA), BP Ungara (NA), Strong     1.       31.     36     VG (b)     Inut: sinuation of pericarp excluding based put     absent or very vessk     PP Ungara (NA), Strong     1.       31.     36     VG (b)     Inut: sinuation of pericarp excluding based put     absent or very weak     Bar, CT01P     1.       (c)     37.     VG (b)     Fruit: stinuation of pericarp excluding based put     absent or very weak     Bar, CT01P     1.       (c)     37.     VG (b)     Fruit: texture of surface     snooff or very slightly wrinkled stong     Hot Base, CT01P     1.       32.     37.     VG (b)     Fruit: color at maturity     yellow rorage     Salightly vrinkled stong     Hot Base, CT01P     1.       33.     38.     VG (b)     Fruit: intensity of color at maturity     yellow rorage     Fruit, close at maturity     yellow rorage     Fruit, close at maturity     stong     Fruit, close at MA, MC11, CT01P     A <t< th=""><th><u></u></th><th></th><th>1</th><th>- 11 -</th><th></th><th></th><th></th></t<>	<u></u>		1	- 11 -			
PQL(i)placenta)angular circularMC11 (MAS) Adipat (MA) Adipat (MA) Adipat (MA)2 3 3 2 223 (MAS)90.25(b)Pruit: sinuation of pericarp at basal partabcent or very weak medianJP Degras (IMA) ST Debak (IMA)1 MASS Tombak (IMA)11.08(b)Pruit: sinuation of pericarp at basal partabcent or very weak medianJP Degras (IMA) ST Debak (IMA)3 ST Tombak (IMA)73136VG (O)Pruit: sinuation of pericarp excluding basal periodabcent or very weak medianBara, CT01P MASS (MAS)1 MASS (MAS)1 MASS (MAS)90.31.36VG (O)Pruit: sinuation of pericarp excluding basal periodabcent or very weak median median transitionBara, CT01P MASS (MAS)1 MASS TOMAS1 MASS TOMAS1 MASS TOMAS91.37VG (O)Pruit: texture of surfacesmooth or very slightly winkled slightly winkledHe Beauty (IMA) MASS TOMASS TOMASS TOMASS TOMASS1 TOMASS TOMASS TOMASS1 TOMASS TOMASS TOMASS TOMASS1 TOMASS 	QL 20	24	VC	Empity shape in gross spation (at level of	Filiptia	Krida 0 (INA)	1
PQ     Image and the second seco	29.	54			Emptic		1
Image: Section of the section of pericarp at basal partcircularAddigat (TMA), Buggar (TMA), Buggar (TMA), Section of pericarp at basal partabsent or very weakPart, Cropp (DMA), Section of pericarp at basal partabsent or very weakPart, Cropp (DMA), Section of pericarp at basal partabsent or very weakPart, Cropp (DMA), Section of pericarp at basal partabsent or very weakPart, Cropp (DMA), Section of pericarp excluding basalabsent or very weakPart, Cropp (DMA), Section of pericarp excluding basalabsent or very weakPart, Cropp (DMA), Section of pericarp excluding basalabsent or very weakPart, Cropp (DMA), PPP (DMA), P	РО		(0)	phicenia)	angular		2
Image: Second							
30. (-) QN         35. (-) QN         VG (-) (-) QN         Put: sinuation of pericarp at basal part (-) QN         absent or very weak medium         PB Ungam (INA) String (INA) (-) (-) QN         1. (-) (-) QN           31. (-) QN         36. (-) QN         VG (-) (-)         Fuilt: sinuation of pericarp excluding basal part         absent or very weak medium         Bara, CTOIP (-) Very strong         1. (-) PB Perisai (INA)         7. (-) PB Perisai (INA)         7. (-) QN           31. (-) QN         36. (-) QN         VG (-)         Fuilt: sinuation of pericarp excluding basal part         absent or very weak weak         Bara, CTOIP (-) Weak         Bara, CTOIP (-) QN         1. (-) QN           32. (-) QN         37. (-) QN         VG (-)         Fuilt: exture of surface         strooth or very sitightly wrinkled sightly wrinkled         Hot Beaury (INA) PB Perisai (INA)         1. Earn, CTOIP (-) MASS (-) (-)           33. (-) QN         38. (-)         VG (-)         Fuilt: intensity of color at maturity (-)         yellow orange regen         Strongly wrinkled 							
(-) QN(b)(b)Full: sinuation of pericarp excluding baad mediumweak mediumBan. (CTD P (MAS) Tombak (MAS) Set Rot 99 (INA). S (MAS)131. (-) QN36(b)Pruit: sinuation of pericarp excluding baad partabsent or very weak weakBan. (CTD P (MAS) PP Perisat (INA)131. (-) QN37(b) (b)Pruit: sinuation of pericarp excluding baad partabsent or very weak weakBan. (CTD P (MAS) PP Perisat (INA)132. (-) QN37(b) (b)Fruit: texture of surfacesmooth or very sightly wrinkled singhtly wrinkledHot Beau(PIA) PP Perisat (INA)733. (-) (-) (-) (-)38VG (b)Fruit: color at maturityyellow orange redMol Ban. (CTD P (MAS)134. (-) (-) (-)39(b)Fruit: color at maturityyellow orange redSumya (INA) Magin (INA)135. (-) (-) (-)38VG (b)Fruit: intensity of color at maturityyellow orange redSumya (INA) Tombak (INA)336 (-) (-) (-)40WG (b)Fruit: intensity of color at maturity (-)weak mediumPIP Derival (INA) Tombak (INA)337. (-) (-) (-)41WG (b)Fruit: intensity of color at maturity (-)weak mediumPIP Derival (INA) Tombak (INA)336 (-) (-) (-)41WG (b)Fruit: intensity of color at maturity (-)weak mediumPIP De						223 (MAS)	
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QN         Las         Las <thlas< th="">         Las         <thlas< th=""> <thlas< th=""> <thlas< th=""></thlas<></thlas<></thlas<></thlas<>		35		Fruit: sinuation of pericarp at basal part	absent or very weak		1
weak mediumTombal (NA) Solic (MAS) Kopy (INA), MC11, Solic (MAS) partTombal (NA) strongTombal (NA) Solic (MAS) HP C13(NA), HP Erisi (INA) P1 Image P P P31.36 (b)VC partFull: simuation of pericarp excluding basal partabsent or very weak weakBrar, CTUP MAS) HP C13(NA), TM SP (INA), TM SP (INA), Solic (MAS)1 Image P Image P strongImage P Image P strongImage P Image P Image P StrongImage P Image P Image P StrongImage P Image P Image P StrongImage P Image P Image P Image PImage P Image P Image P Image PImage P Image P Image PImage P Image P Image PImage P Image P Image PImage P Image P32. (1) (2) (2)37 (b)VC (b)Full: texture of surfacesmooth or very slightly wrinkledHor Beauty (INA), P Image P Image P Image P Image PImage P Image P Image P Image PImage P Image P Image P Image PImage P Image P Image P Image PImage P Image P Image P Image P Image PImage P Image P Image P Image P Image P Image PImage P Image P Image P Image P Image P Image PImage P Image P <td></td> <td></td> <td>(D)</td> <td></td> <td></td> <td></td> <td></td>			(D)				
Image: Section of the section of pericarp excluding based (+) QNMedia (NA) (NAS) 	QIV				weak		3
Image: Section of the section of th							
Image: strong werk werk werk werk werk werk werk werk							
Image: stand s							
31.36VG (b)Fruit: situation of pericarp excluding basal partabsent or very weak weakBara, CT01P (MAS) (MAS)1 (MAS) (MAS)1 (MAS) (MAS)1 (M							
(+) QN(b)partweak(MAS) PEG CH2(NA), MAS) PEG CH2(NA), MAS) PEG CH2(NA), MAS) PEG CH2(NA), MAS)332. (°) QN37.VG (b)Fuilt texture of surfacesmooth or very slightly wrinkled slightly wrinkled slightly wrinkled slightly wrinkled MAS)1033. (°) QN38.VG (b)Fuilt color at maturitysmooth or very slightly wrinkled slightly wrinkled stightly wrinkled stightly wrinkledHot Beauty (INA), TM 888 (INA), AS Solok (MAS)133. (°) (·) (·) (·) (·) (·) (·) (·)7Fuilt: color at maturitygellow orange redSolok (MAS), Toppial (INA)134. QN39. (b)Fuilt: intensity of color at maturityight ight mediumFuilt: COIP MAS), red335. (·) QN40.VG (b)Fuilt: intensity of color at maturitylight mediumFuilt mediumTompial (INA), Toppial					very strong	IPB Perisai (INA)	9
(+) QN(b)partweakMRAS PB CH2(NA), MAS Tajping 1 (NA) TM 99 (INA) PP Perisai (INA	31	36	VG	Eruit: sinuation of pericarn excluding basal	absent or very weak	Bara CT01P	1
(+) QN QNImage: Solution of the state of surfaceweakIPE CHS(NA), MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,Solok1 MC1,Solok3 MC1,So	51.	50			absent of very weak		1
QN         Image of the second se	(+)		(-)	r	weak		3
Image: Section of the section of th						MC11, Solok	
Strong very strongTM 990 (NA) PB Perisai (INA)7 P PB Perisai (INA)32. (*) (NA)37VG (b)Fruit: texture of surfacesmooth or very slightly wrinkledHot Beauty (INA), Mara, CT01P (MAS)1 MASD33. (*) (*) (*) (*) (*) PQ38VG (b)Fruit: color at maturityyellow orange redSuily (INA) Magno (INA)1 Magno (INA) (MAS)34. (*) (*) (*) PQ39VG (b)Fruit: intensity of color at maturitylight green lightBara, Solok (MAS) Tequila (INA)3 medium34. (*) (*) (*)39VG (b)Fruit: intensity of color at maturitylight green darkBara, Solok (MAS) Full: (TOTIP (MAS) MC11, CT01P (MAS)3 medium35. (*) (*) (*) (*) (*)40VG (b)Fruit: glossinessweak medium strongIPB Perisai (INA), Gada (INA)3 Gada (INA)736 (*) (*) (*) (*) (*) (*) (*)42VG (b)Fruit: stalk cavityabsent strongTombak (INA), Gada (INA)1 corupe (MAS) strong1 medium shallow medium1 MC11, CT01P (MAS)37. (*) (*) (*) (*) (*)42VG (b)Fruit: stalk cavityweak wery shallow medium shallow1 moderately depressed1 Adipati (INA), Suriya (INA)3 strong37. (*) (P) (P) (P) (P) (P)42VG (b)Fruit: shape of apexvery shallow wery acute moderately							
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32. (*) QN37VG (b)Pruit: texture of surfacesmooth or very slightly wrinkled 							
(*) QN(b)(b)(b)Fuilt: color at maturitystightly wrinkled strongly wrinkledBara, CT01P MAS), TM 858 (INA), MOI 1 (MAS), 3333. (*) (*) (*) PQ38VG (b)Fruit: color at maturityyellow orange redSuniya (INA) Magno (INA), Tombak (INA), Tombak (INA), MAS)134. (*) (*) QN39VG (b)Fruit: intensity of color at maturityyellow orange greenSuniya (INA), Tombak (INA), To					very strong	IPB Perisai (INA)	9
(*) QN(b)(b)Fuilt: color at maturitySubscriptionBara, CT01P MAS), TM S88 (NA), MC11 (MAS)333. (*) (*) (*)38VG (b)Fruit: color at maturityyellow orange redSuniya (INA) Magno (INA) Tombak (INA), Tombak (INA), MAS)134. QN39VG (b)Fruit: intensity of color at maturityyellow orange greenSuniya (INA) Tombak (INA), Tombak (INA)	32	37	VG	Fruit: texture of surface	smooth or very slightly wrinkled	Hot Beauty (INA)	1
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33. (°) (+) PQ38VG (b)Fruit: color at maturityyellow orange redSuitya (INA) mage red1 Magne (INA) Tequila (INA) A MC11. CTOIP (MAS) Tequila (INA) A MC11. CTOIP (MAS) Tequila (INA), A MC11. CTOIP (MAS) Tequila (INA), A A MC11. CTOIP (MAS) Tequila (INA), A MC11. Solok (MAS)1 1 2 Tombak (INA), A A A A MC11. CTOIP (MAS) Tequila (INA), A MC11. CTOIP (MAS) Tequila (INA), A MC11. CTOIP (MAS) Tequila (INA), A Tajung 2 (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), A Tombak (INA), Tombak (IN						MC11 (MAS)	
3. (*) (+) PQ3. (*) (*)VG (b)Fruit: color at maturityyellow orange redSuniya (INA) Magno (INA) Magno (INA) Magno (INA) Magno (INA) Magno (INA) MCI1, CTOIP (MAS) Tequila (INA)1 1 2 Tombak (INA), MCI1, CTOIP (MAS) Taping 2 (INA), MCI)1 1 2 2 1 <br< td=""><td></td><td></td><td></td><td></td><td>strongly wrinkled</td><td></td><td>3</td></br<>					strongly wrinkled		3
(*) PQ PQ(b)(b)(b)(b)(b)(b)(b)(c)						Solok (MAS)	
(*) PQ PQ(b)(b)(b)(b)(b)(b)(b)(c)	33	38	VG	Emit: color at maturity	vellow	Supiya (INA)	1
(+) PQImage: Probability of probabili		30		Fruit. color at maturity			
PQ allImage: Second se			(0)		•		
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34. QN39VG (b)Fruit : intensity of color at maturity (b)light mediumBara, Solok (MAS) Tanjug 2 (INA), MC11, CT01P (MAS) IPB Ungara (INA)335. (+) QN40VG (b)Fruit: glossinessweak mediumIPB Perisai (INA), Kopay (INA), MC11 (MAS) Gada (INA)336. (+) QN41VG (b)Fruit: stalk cavityweak absentIPB Perisai (INA), Kopay (INA), MC11 (MAS) Gada (INA)336 (+) QL41VG (b)Fruit: stalk cavityabsent presentTombak (INA), CT01P (MAS) IPB Perisai (INA), MC11, Solok (MAS)137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow wery shallow138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA), Adipati (INA), Ad	-						
34. QN39VG (b)Fruit : intensity of color at maturity (b)light mediumBara, Solok (MAS) Tanjung 2 (INA), MC11, CTO1P (MAS) (MAS) 1PB Ungara (INA)335. (+) QN40VG (b)Fruit: glossinessweak mediumIPB Perisai (INA), medium336 (*) (+) QL41VG (b)Fruit: stalk cavityweak absentIPB Perisai (INA), medium536 (*) (+) QL41VG (b)Fruit: stalk cavityabsent presentTombak (INA), CTO1P (MAS) MC11, Solok (MAS)137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow and cavity137. (+) QN42VG (b)Fruit: stape of apexvery shallow very deep138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately depressedKopay (INA), Adipati (INA), 2 CTO1P, MC11 (MAS)1 Adipati (INA), 2					brown	Tequila (INA)	
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Image: Second		39		Fruit : intensity of color at maturity			
Image: constraint of the state of the sta	QN		(0)		medium		3
Image: state of the state cavitydarkIPB Ungara (INA)735. (+) QN40 (b)VG (b)Fruit: glossinessweakIPB Perisai (INA), CT01P (MAS) strong336 (*) (+) QL41 (b)VG (b)Fruit: stalk cavityabsentTombak (INA), CT01P (MAS) present136 (*) (+) QL41 (b)VG (b)Fruit: stalk cavityabsentTombak (INA), CT01P (MAS) present137. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS) adeep138. (+) PQ43 (b)VG (b)Fruit: shape of apexvery acute rounded moderately acuteAdipati (INA), Adipati (INA),<							
(+) QN(b)Image: Comparison of the comparison o					dark	· · · · ·	7
(+) QN(b)(b)Full: stalk cavitymedium strongCT01P (MAS) Kopay (INA), Gada (INA)536 (*) (+) QL41VG (b)Fruit: stalk cavityabsentTombak (INA), present137. (+) QL42VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow138. (+) PQ43VG (b)Fruit: shape of apexvery deep938. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately depressed very depressedKopay (INA) Adipati (INA), Adipati (INA), 2138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately depressed very depressedKopay (INA) Adipati (INA), Adipati (INA), Adipati (INA), Adipati (INA), Adipati (INA), Adipati (INA), 4 Suniya (INA)3							
QNImage: Second state of the sta		40		Fruit: glossiness	weak		3
MC11 (MAS) Gada (INA)736 (*) (+) QL41VG (b)Fruit: stalk cavityabsent presentTombak (INA), CTOIP (MAS) IPB Perisai (INA), MC11, Solok (MAS)137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS) IS Solok (MAS)137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS)138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), Z CTOIP, MC11 (MAS) Tombak (INA), Adipati (INA), 4 Suniya (INA)1			(b)				_
36 (*) (+) QL41VG (b)Fruit: stalk cavityabsent absentTombak (INA), CT01P (MAS) IPB Perisai (INA), MC11, Solok (MAS)137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), Solok (MAS)138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT01P, MC11 (MAS) Tombak (INA)138. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately depressed very depressedKopay (INA) Adipati (INA) CT01P, MC11 (MAS) Tombak (INA) Adipati (INA) Adi	QN				medium		5
36 (*) (+) QL41 (b)VG Fruit: stalk cavityFruit: stalk cavityabsent presentTombak (INA), CT01P (MAS) PH berisai (INA), MC11, Solok (MAS)1 (TO300 (MAS)37. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallow138. (+) PQ43 (b)VG (b)Fruit: shape of apexvery deep938. (+) PQ43 (b)VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT01P, MC11 (MAS) Tombak (INA)1 Adipati (INA), 2 CT01P, MC11 (MAS) Tombak (INA)3 a HD Bungara (INA) 4 Suniya (INA)3					strong		7
(*) (+) QL(b)(b)Fuit: depth of stalk cavitypresentCT01P (MAS) IPB Perisai (INA), MC11, Solok (MAS)937. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS) IPB Perisai (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS) deep338. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), 2 CT01P, MC11 (MAS) Tombak (INA) 4 Suniya (INA)3					stong		,
(*) (+) QL(b)(b)Fuit: depth of stalk cavitypresentCT01P (MAS) IPB Perisai (INA), MC11, Solok (MAS)937. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS) IPB Perisai (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS) deep338. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), 2 CT01P, MC11 (MAS) Tombak (INA) 4 Suniya (INA)3	36	41	VG	Fruit: stalk cavity	absent	Tombak (INA),	1
(+) QLLImage: Second constraints of the second constraints							
37. (+) QN42 (b)VG Fruit: depth of stalk cavityvery shallow137. (+) QN42 (b)Fruit: depth of stalk cavityvery shallow1QN(b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS)3MC11 (MAS) IPB Perisai (INA), Solok (MAS)Fire938. (+) PQ43VG (b)Fruit: shape of apexvery deep938. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT0IP, MC11 (MAS)1PQIIAdipati (INA), Adipati (INA), CT0IP, MC11 (MAS)3IPB Ungara (INA) Suniya (INA)3IPB Ungara (INA) Suniya (INA)4IPB Ungara (INA) Suniya (INA)4	(+)				present	IPB Perisai (INA),	9
37. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallow137. (+) QN42 (b)VG (b)Fruit: depth of stalk cavityvery shallowAdipati (INA), MC11 (MAS)39MC11 (MAS) IPB Perisai (INA), Solok (MAS) Suniya (INA)538. (+) PQ43VG (b)Fruit: shape of apexvery deep938. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT0IP, MC11 (MAS) Tombak (INA)1PQ0Image: State of apexvery depressed very depressedFruit: Shape of apexVery acute moderately depressed very depressedKopay (INA) Adipati (INA), Tombak (INA)19Image: State of apexVery depressed very depressedSuniya (INA)19Image: State of apexVery depressed very depressedKopay (INA) Adipati (INA), Tombak (INA)19Image: State of apexVery depressed very depressedState of apex9Image: State of apexVery depressed very depressedKopay (INA)110Image: State of apexVery depressed very depressedImage: State of apex11Image: State of apexVery depressed very depressedImage: State of apex11Image: State of apexImage: State of apexImage: State of apex11Image: State of apexVery depressedImage: State of apex12Image: State of apex <t< td=""><td>QL</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	QL						
(+) QN(b) (b)(b)shallowAdipati (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS) Suniya (INA)3						(MAS)	
(+) QN(b) (b)(b) (b)(b) (b)(b)Adipati (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS) Solok (MAS	37	40	VC	Fruit: depth of stalls covity	very shallow		1
QNAdipati (INA), MC11 (MAS) IPB Perisai (INA), Solok (MAS) Suniya (INA)338. (+) PQ43VG (b)Fruit: shape of apexvery deep938. (+) PQ(b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), 2 CT01P, MC11 (MAS) Tombak (INA)1PQIIIIPQIII		42		Fruit, deput of stark cavity	very shanow		1
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Solok (MAS) Suniya (INA)     7       38. (+) PQ     43     VG (b)     Fruit: shape of apex     very deep moderately acute     Kopay (INA) Adipati (INA), CT01P, MC11 (MAS)     1       PQ     (b)     Fruit: shape of apex     very acute moderately acute     Kopay (INA) Adipati (INA), CT01P, MC11 (MAS)     1       PQ     (b)     Fruit: shape of apex     very acute moderately acute     Kopay (INA) Adipati (INA), CT01P, MC11 (MAS)     3       PU     Image: Comparison of the problem (MAS)     Tombak (INA)     3       PU     Image: Comparison of the problem (MAS)     Tombak (INA)     3       PU     Image: Comparison of the problem (MAS)     Tombak (INA)     3       IPB Ungara (INA)     4     Suniya (INA)     5					medium	IPB Perisai (INA),	5
38. (+) PQ43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT01P, MC11 (MAS) Tombak (INA)1 Adipati (INA), 2 CT01P, MC11 (MAS)PQIIIIIPQIIIIIPQIIIIIIPQIIIIIIIIIIIIPQIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII							
38.43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA) Adipati (INA), CT01P, MC11 (MAS)1 Adipati (INA), CT01P, MC11 (MAS)PQImage: Second s					deep	Suniya (INA)	7
38.43VG (b)Fruit: shape of apexvery acute moderately acuteKopay (INA)1PQ(b)Fuit: shape of apexvery acute moderately acuteAdipati (INA), CT01P, MC11 (MAS)2PQImage: Second se					yany daan		0
(+) PQ (b) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	38	13	VC	Fruit: shape of apex		Konay (INA)	
PQ PQ rounded moderately depressed very depressed PQ TOT01P, MC11 (MAS) Tombak (INA) 3 IPB Ungara (INA) 4 Suniya (INA) 5		43		Fruit: snape of apex			
rounded (MAS) Tombak (INA) 3 IPB Ungara (INA) 4 very depressed Suniya (INA) 5	PO						2
rounded Tombak (INA) 3 moderately depressed IPB Ungara (INA) 4 very depressed Suniya (INA) 5	- ×						
moderately depressed IPB Ungara (INA) 4 very depressed Suniya (INA) 5					rounded		3
						IPB Ungara (INA)	4
			1		very depressed	Suniya (INA)	5
39. 44 VG Fruit: depth of interloculary grooves absent or very shallow Tombak, IPB 1						•	

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	- 12 -						
( <del>+)</del> QN		(b)		shallow medium deep	Perisai (INA), CT01P, MC11 (MAS) Edison, Bianca (INA) Magno (INA) Tequila (INA)	3 5 7	
40. (*) (+) QN	45	MG (b)	Fruit: number of locules	predominantly two equally two and three predominantly three equally three and four predominantly four and more	Gada (INA), CT01P, MC11 (MAS) - Tanjung 1(INA) - Edison (INA)	1 2 3 4 5	
41. (*) QN	46	VG (b)	Fruit: thickness of flesh	very thin thin medium thick very thick	TM 999 (INA) Tanamo (INA), Bara Tanjung 1 (INA), CT01P, MC11 (MAS) Bianca (INA) Edison (INA)	1 3 5 7 9	
42. QN	47	VG/MS (b)	Stalk: length	very short short medium long very long	- IPB Perisai (INA), Solok (MAS) Kresna (INA), CT01P (MAS) Krida 9 (INA) Kopay (INA)	1 3 5 7 9	
43. QN	48	VG/MS (b)	Stalk: thickness	very thin thin medium thick	Laris (INA), Bara Tombak (INA), MC11, Green Eagle 223 (MAS) Edison (INA)	1 3 5 7	
44. (+) QL	49	VG (b)	Calyx: aspect	very thick non enveloping enveloping	Suniya (INA) Krida 9 (INA), CT01P, MC11 (MAS)	9 1 2	
45 (*) (+) QL	50	VG (b)	Fruit: capsaicin in placenta Add explanation: it's only observed the placenta	absent present	Edison (INA) Bara, CT01P, MC11 (MAS)	1 9	
(+) QN	51	MG (b)	Fruit: <u>For varieties with capsaicin in</u> placenta present only: intensity of capsaicin	weak medium strong	IPB Perisai (INA) Tombak (INA), CT01P, MC11 (MAS) Bara	1 2 3	
46. (+) QN	52	MS	Time of beginning of flowering (first flower on second flowering node	early medium late	IPB 92 (INA) IPB CH3 (INA) Tombak (INA)	3 5 7	
47. (+) QN	53	VG	Time of maturity	very early early medium late very late	IPB 92 (INA) Tanjung 2 (INA) IPB CH3 (INA) Hot Bauty (INA) Tombak (INA)	1 3 5 7 9	
48. (+) QL	54		Resistance to Tobamo Virus (TMV)	absent present			
48.1 (+) QL	54.1		Pathotype 0 (Tobacco Mosaic Virus (0))	absent present		1 9	
48.2 (+)	54.2		Pathotype 1-2 (Tobacco Mosaic Virus (1- 2))	absent present		1 9	



		- 13 -		
QL				
48.3 (+) QL	54.3	Pathotype 1-2-3 (Pepper Mild Mottle Virus (1-2-3))	absent present	1 9
49. (+) QL	55	Resistance to Potato Virus Y (PVY)	absent present	
49.1 QL	55.1	Pathotype 0	absent present	1 9
49.2 QL	55.2	Pathotype 1	absent present	1 9
49.3 QL	55.3	Pathotype 1-2	absent present	1 9
50. (+) QL	56	Resistance to Phytophthora capsici	absent present	1 9
51. (+) QL	57	Resistance to Cucumber Mosaic Virus (CMV)	absent present	1 9
52. (+) QL	58	Resistance to Tomato Spotted Wilt Virus (TSWV)	absent present	1 9
53. (+) QL	59	Resistance to Xanthomonas Campestris Virus pv. vesicatoria	absent present	1 9

Note: The set of example variety is identified by the country code where the set is coming from

## 8. <u>Explanations on the Table of Characteristics</u>

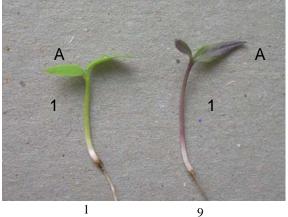
### 8.1 Explanations covering several characteristics

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

- (a) Fruit characteristics which should be examined before maturity, i.e. before the first color change
- (b) Fruit characteristics which should be examined at maturity, i.e. after the time of the first color change

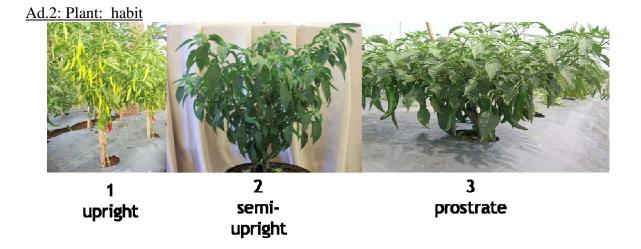
### 8.2 *Explanations for individual characteristics*

### Ad. 1. Seedling: Anthocianin coloration of hypocotyls



absent

present



### Ad.3: Plant: Length of stem

The length of the stem is measured from the cotyledons to the first flower branch.

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### Ad. 4: Plant: shortened internode (in upper part)

Ad. 5: Varieties with shortened internodes only: Plant: number of internodes between the first flower and shortened internodes

The tests should be done on plants which have not been pruned. The shoot system of pepper consists of main stems, which are branched off from the main axis and side shoots. Two growth types of the main stems can be distinguished:

<u>Growth type A</u>: the main stems grow indeterminately; one or two flowers develop per node and shortened internodes never develop.

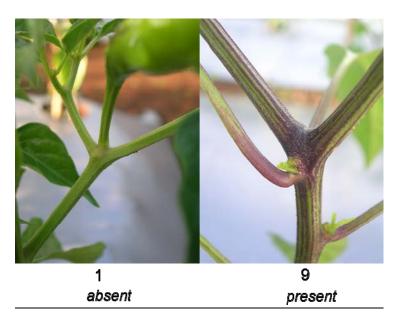
<u>Growth type B</u>: after the first branching of the main axis, shorter internodes appear and the growth of the main stem ends in a bunch of flowers (it appears as if there are more than two flowers per node).

Side shoots develop from the nodes on the main axis and on the main stems.

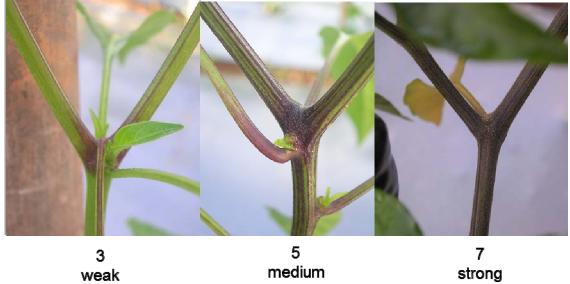
Growth type A		Growth ty	уре В
Char. 4: Plant: shortened internodes (in upp	<u>per part)</u>		
absent		preser	ıt
Char. 5: Varieties with shortened internodes only: Plant: number of internodes between the first flower and	none (1)	one to three (2)	more than three (3)
shortened internodes			
flower			
0 node			
]] main stem			
side shoots			

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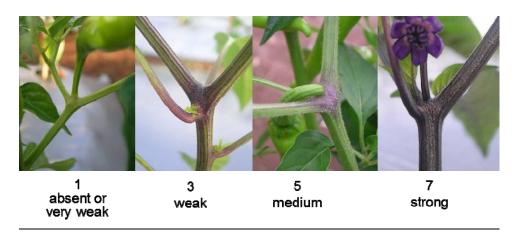
# Ad. 7. Plant: Anthocyanin coloration of nodes



Ad.8. Stem: intensity of anthocyanin coloration of nodes



## Ad. 9. Stem: hairiness of nodes



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## Ad. 10: Plant: height

To be observed after a fruit set on several nodes. Poor fruit set may influence the vigor and thus the height of the plant.

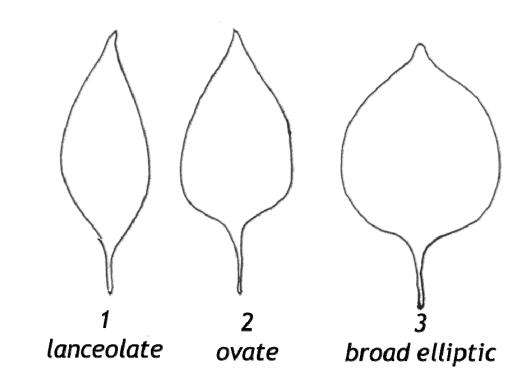
Ad. 14. Leaf: anthocyanin coloration



l absent

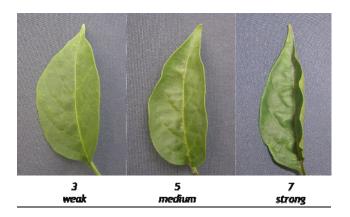
present

Ad. 15: Leaf: shape

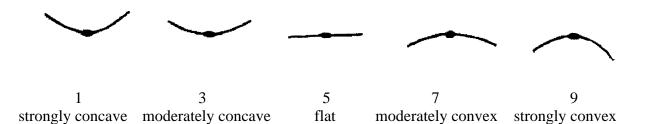


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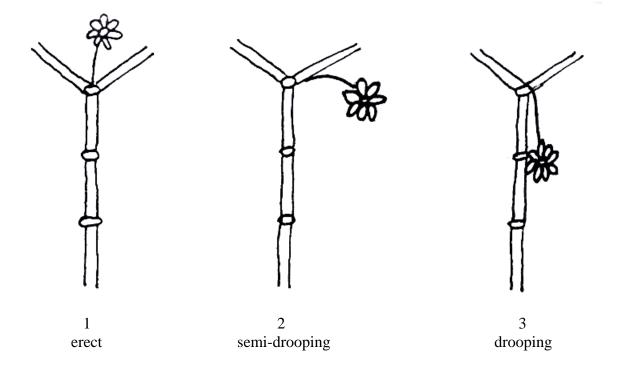
# Ad. 16. Leaf: undulation of margin



Ad. 18: Leaf: profile in cross section

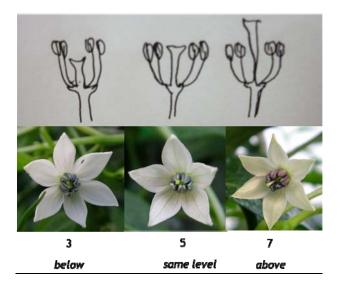


# Ad. 20: Peduncle: attitude

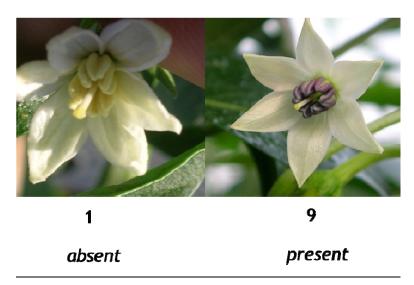


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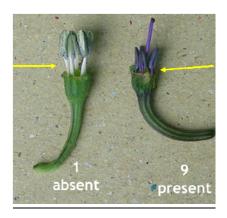
# Ad. 21. Flower: Stigma exsertion



## Ad. 22: Flower: Anthocyanin coloration in anther

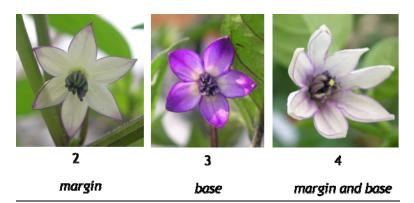


Ad. 23: Flower: Anthocyanin coloration on filament

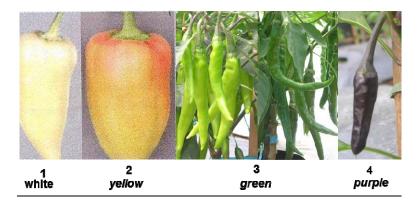


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## Ad. 24: Flower: secondary color of corolla



## Ad. 25. Fruit : Color before maturity



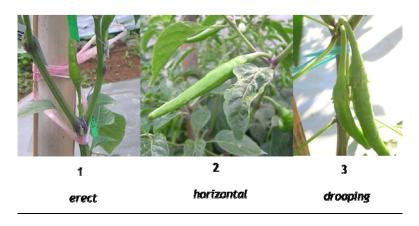
## 27. Fruit : Anthocyanin Coloration





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# Ad. 28. Fruit : Attitude

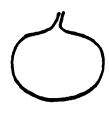


Ad 29. Fruit: length



Ad. 32: Fruit: shape in longitudinal section



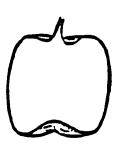


2 circular



1 oblate

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4 square

5 rectangular





7 moderately triangular

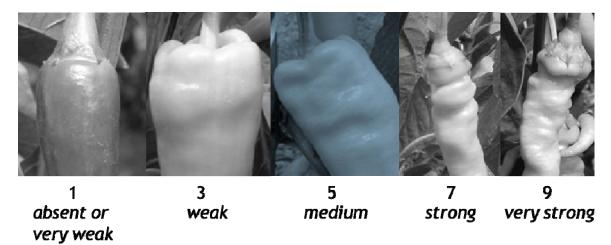




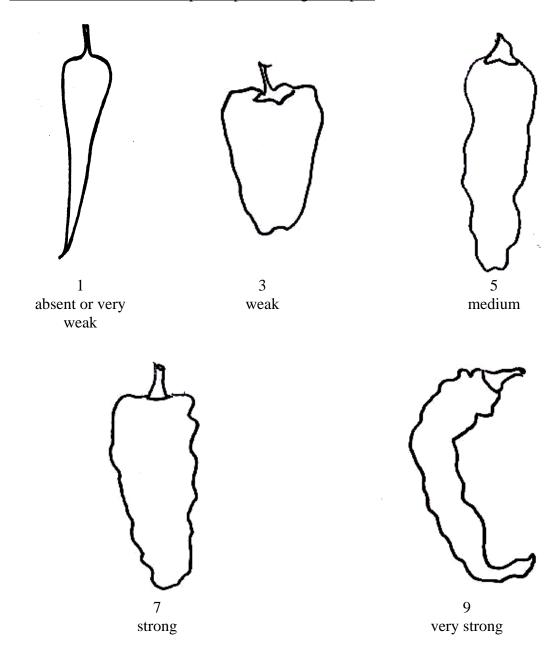
8 narrowly triangular

9 hornshaped

Ad. 35: Fruit: sinuation of pericarp at basal part

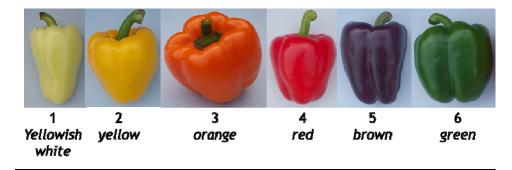


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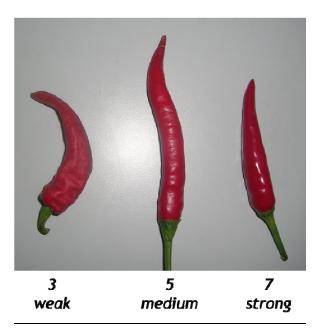
Ad. 36: Fruit: sinuation of pericarp excluding basal part





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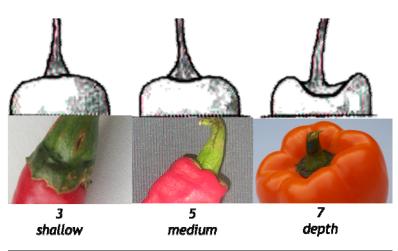
# Ad. 40. Fruit : Glossiness



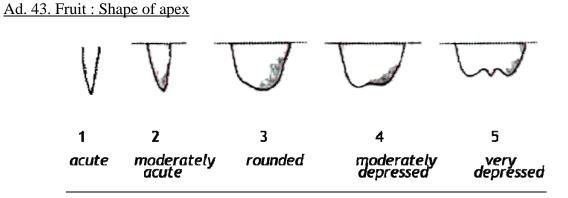
## Ad. 41. Fruit : Stalk cavity



## Ad. 42. Fruit: depth of stalk cavity



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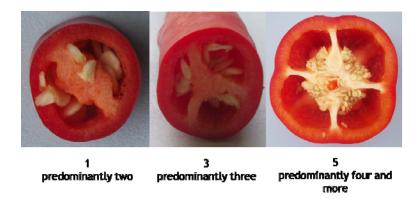


Ad. 44: Fruit: depth of interloculary grooves

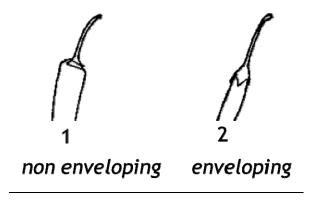
To be observed in the middle part of the fruit.



### Ad. 45. Fruit : Fruit: number of locules



Ad. 44: Calyx: aspect



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### Ad. 50: Fruit: capsaicin in placenta

The Intensity of capsaicin is observed by tasting the placenta at the third part from the base, in compare with example variety.

### Ad. 52. Time of beginning of flowering

Time of beginning of flowering is reached when 50% populations produce fully open flower.

### Ad. 53. Time of maturity

Maturity is reached when 50% of the populations completely change to the final color (ripe color).

### Ad. 48: Resistance to Tobamovirus

Maintenance of pathotypes

Type of medium:	On plants or dehydrated leaves (in deep-freezer or method BOS)
Special conditions:	Regeneration of the virus on plant material before inoculum preparation
Execution of test	
Growth stage of plants:	When cotyledons are fully developed or at "first leaf" stage
Temperature:	20-25°C
Growing method:	Sowing and raising of seedlings in boxes or soil blocks in glasshouse
Method of inoculation:	Rubbing of cotyledons with a virus suspension
Duration of test	
- Sowing to inoculation:	10 to 15 days
- Inoculation to reading:	10 days
Number of plants tested:	15 to 30 plants

### Genetics of virus pathotypes and resistant genotypes:

The genetic resistance to Tobamoviruses is controlled by 5 alleles located on the same locus. The table below shows the relationship between virus pathotypes and resistance genotypes:

	Pepper Tobamovirus Pathotypes					
Virus:	TMV	ToMV	PMMoV			
Strain:	U1	P11	P14			
Strain.	Feldman	Obuda Pepper Mosaic Virus	Samsun latens			
Genotype / mark	P <sub>0</sub>	P <sub>1-2</sub>	P <sub>1-2-3</sub>			
L-L-	S	S	S			
$L^1L^1$	R	S	S			
$L^{3}L^{3}$	R	R	S			
L <sup>4</sup> L <sup>4</sup>	R	R	R			

Pepper Genotype reactions to Tobamovirus Pathotypes

Legend:

resistant

**S** =

**R** =

TMV = Tobacco Mosaic Virus

ToMV = Tomato Mosaic Virus

PMMoV = Pepper Mild Mottle Virus

## Ad. 49: Resistance to Potato Virus Y (PVY)

# Maintenance of pathotypes

Type of medium:	On susceptible plants		
Special conditions:	For t	he strain PVY(0): use the line TO72(A) he strain PVY(1): use the line Sicile 15 he strain PVY(1-2): use the line SON41	
Execution of test			
Growth stage of plants	8:	Young plants at the stage of developed cotyledons - <u>first pointing leaf</u>	
Temperature:		18-25°C	
Growing method:		Raising of plants in glasshouse	
Method of inoculation:		Rubbing of cotyledons with a virus solution Composition of the solution: <u>inoculum</u> : 4 ml extraction solution for 1 g infected leaves + 80 g activated carbon + 80 mg carborundum; <u>extraction solution</u> : buffer solution diluted 1/20 with 0.2% diethyl dithiocaremate of sodium (DIECA); <u>buffer solution</u> : (for 100 ml sterile water) 10.8 g NA <sub>2</sub> HPO <sub>4</sub> + 1.18 g K <sub>2</sub> HPO <sub>4</sub> at pH 7.1-7.2	
Duration of test			
Sowing to inoculation:		10 to 15 days	
Inoculation to reading:		3 weeks (2 weeks minimum, 4 weeks maximum)	
Number of plants tested:		60 plants	

<u>Remarks</u>: The test should not be conducted at high temperatures.

Standard varieties:	Pathotype 0	Pathotype 1	Pathotype 1-2
Sensitive varieties:	Yolo Wonder	Yolo Wonder,	Florida VR2,*
		Yolo Y	Yolo Wonder,
			Yolo Y
Resistant varieties:	Yolo Y	Florida VR2	Serrano Criollo de
			Morenos

\* Florida VR2 can exhibit diffused and very late symptoms.

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### Ad. 50: Resistance to Phytophthora capsici

Scoring must be carried out under conditions of controlled infection:

22°C

Maintenance of inoculum

Inoculum and type of medium: *Phytophthora capsici* strain 101, to be cultivated on V8 juice-agar (1%) in Petri's dishes.

Conduct of test

Growth stage of plants: around eight-week old plants, grown in greenhouse (stage: first flower bud)

Temperature:

Light: 12 hours/day

Method of inoculation:

ation: Plants are cut just below the point of first branching. A disc of mycelium of 4 mm-diameter should be used as inoculum. The disc is placed on the freshly cut stem. The top of the stem is wrapped with a piece of aluminium foil, to keep it wet. Infected plants are transferred to a growth chamber kept at 22°C.

Duration of test:

From sowing to inoculation: between 6 and 8 weeks

From inoculation to scoring:	first scoring:	7 days
	second scoring:	14 days
	final scoring:	21 days

Number of plants tested: 20 plants

Scoring: The length of necrosis on the stem, induced by the fungus development, is recorded once a week during 3 weeks, on each plant. The aluminium foil on the top of the stem should be removed 7 days after the inoculation. The first reading should take place immediately after the removal of the aluminium foil. Subsequent scoring should be made on the 14<sup>th</sup> and 21<sup>st</sup> day counting from the day of inoculation. The distance (in mm) between the lowest point reached by the necrosis and the top of the stem should be recorded.

Standard varieties:Susceptible: Yolo WonderResistant: Chistera, Favolor, Solario, Phyo 636 (given in the<br/>order of their level of resistance)

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# Ad. 51: Resistance to Cucumber Mosaic Virus (CMV)

Maintenance of pathotypes

Strain:	Fulton
Type of medium:	On susceptible plants: Vinca rosea
Special conditions:	-
Inoculum production:	Crushing of 1g of fresh leaves of <i>Vinca rosea</i> in 4 ml of Phosphate buffer 0.03M pH 7 + DIECA (diethyl dithiocaremate de sodium) (1 for 1000) + 300 mg of activated carbon + 80 mg of carborundum
Execution of test:	
Growth stage of plants:	Young plants at the stage of developed cotyledons. First leaf non pointing
Number of plants:	50 plants
Growing conditions:	22°C, 12 hours of light
Growing method:	Raising of plants in climatised room
Method of inoculation:	Mechanical rubbing of cotyledons with a virus solution, the plants are kept in darkness for 48 hours
Duration of test:	
From sowing to inoculation:	12 to 13 days
From inoculation to reading:	3 readings at 10, 15 and 21 days after inoculation
Standard varieties:	
Susceptible variety:	Yolo Wonder
Tolerant (T) or resistant (R) varieties:	Milord (T) Vania (R)

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# Ad. 52: Resistance to Tomato Spotted Wilt Virus (TSWV)

Maintenance of patothypes:

Type of medium:	Pepper fruit in deep-freezer (-70 °C)	
Special condition:	Regeneration of the virus on <i>Nicotiana rustica</i> or <i>Nicotiana benthamiana</i> plants before inoculation	
Execution of test:		
Growth stage of the plant	s: Two leaves expanded	
Temperature:	20 - 22 °C	
Light:	Extra light in winter	
Growing method:	Sowing in greenhouse	
Method of inoculation:	Mechanical, rubbing on cotyledons, inoculum suspension 10 $^{\rm o}{\rm C}$	
Duration of test:		
from sowing to inoculation from inoculation to reading	•	
Number of tested plants:	20 plants	
Standard varieties.		
Susceptible:	Lamuyo	
Resistant:	Galileo, Jackal, Jackpot	
Ad. 53: Resistance to Xa	nthomonas campestris pv. vesicatoria	
Maintenance of pathotype	<u>es</u>	
Type of medium:	PDA (Potato, Dextrose, Agar ) medium	
Special conditions: culture. Adjusting inocul	48 hours <i>Xanthomonas campestris</i> pv. <i>vesicatoria</i> um concentration of bacteria-cellular $10^7$ .	
Execution of test		
Growth stage of plants:	6th to 8th true leaves	
Temperature:	24 °C night, 25°C day	

Temperature:24 °C night, 25°C day

Relative humidity: 80%

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Light:30 000 lx, day length 16 hoursGrowing method:Sowing in boxes in climate chamber or in glasshouseMethod of inoculation:Infiltration into abaxial surface of a leaf in 13-15 mm<br/>diameter spotsDuration of the test:10-14 daysNumber of plants tested:15 to 30 plantsRemarksSometeria path-types and resistant genotypes:Resistant varieties:Aladin, Camelot, ECR-20R, Kaldóm, Kalorez, Lancelot,<br/>Pasa

### 9. <u>Literature</u>

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# 10. <u>Technical Questionnaire</u>

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
			Application date: (not to be filled in by the applicant)
		HNICAL QUESTIONN ction with an application	VAIRE on for plant breeders' rights
1.	Subject of the Technical Ques	tionnaire	
	1.1 Botanical name	apsicum annuum L.	
	1.2 Common Name Sv	veet Pepper, Hot Peppe	er, Paprika, Chili
2.	Applicant		
	Name		
	Address		
	Telephone No.		
	Fax No.		
	E-mail address		
	Breeder (if different from app	licant)	
3.	Proposed denomination and b	reeder's reference	
	Proposed denomination (if available)		
	Breeder's reference		

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TEC	CHNI	CAL Q	UESTIONNAIRE	Page {x} of {y}	Reference Number	:
4.	4. Information on the breeding scheme and propagation of the variety					
	4.1	Breed	ling scheme			
		Varie	ty resulting from:			
		4.1.1	Crossing			
			(a) controlled c		[ ]	l
			(b) partially know		[ ]	l
			(please state (c) unknown cr	e known parent variety( oss	1es))	l
		4.1.2	Mutation (please state parer	nt variety)	[ ]	l
		4.1.3	Discovery and dev (please state wher how developed)	velopment e and when discovered	and [ ]	l
		4.1.4	Other (please provide de	etails)	[ ]	I
	4.2	Metho	od of propagating the	e variety		
		4.2.1	Seed-propagated var	rieties		
			<ul> <li>(a) Self-pollination</li> <li>(b) Cross-pollination</li> <li>(c) Hybrid</li> <li>(d) Other (please provide)</li> </ul>	tion	[ ] [ ] [ ]	
		4.2.2	Other (please provide deta	ils)	[ ]	

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TECI	HNICAL QUESTIONNAIRE P	age {x} of {y}	Reference Number:	
5. corre	Characteristics of the variety to sponding characteristic in Test Gu	,		
	Characteristics		Example Varieties	Note
5.1 (1)	Seedling: anthocyanin coloration of h	ypocotyl		
	absent		Laris	1[]
	present		IPB Ungara	9[]
5.2 (4)	Plant: shortened internode (in upper	part)		
	absent		Tombak	1[]
	present		IPB92	9[]
5.3 (19)	Peduncle: attitude			
	erect		Bara	1[]
	semi-drooping		-	2[]
	drooping		Tanjung	3[]
5.4 (21)	Fruit: color ( <u>before</u> maturity)			
	greenish white		Solok, Bianca	1[]
	yellow		-	2[]
	green		Tanamo	3[]
	purple		IPBUngara	4[]

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	Characteristics	Example Varieties	Note
5.5 (28)	Fruit: shape in longitudinal section		
	oblate	-	1[]
	circular	-	2[]
	cordate	IPB Ungara	3[]
	square	Edison	4[]
	rectangular	-	5[]
	trapezoidal	Bianca	6[]
	moderately triangular	Genie, Solok	7[]
	narrow triangular	Bara	8[]
	hornshaped	IPBPerisai	9[]
5.6 (33)	Fruit: color ( <u>at</u> maturity)		
	yellow	Suniya	1[]
	orange	Magno	2[]
	red	Tombak	3[]
	brown	Tequila	4[]
	green	-	5[]
5.7 (40)	Fruit: number of locules		
	predominantly two	Gada	1[]
	equally two and three	-	2[]
	predominantly three	Tanjung	3[]
	equally three and four	-	4[]
	predominantly four and more	Edison	5[]
	Characteristics	Example Varieties	Note
5.8 (45)	Fruit: capsaicin in placenta		
	absent	Edison	1[]
	present	Bara	9[]

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TECH	INICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
5.9(i) (48.1)	Resistance to Tobamovirus - Pathotype 0 (Tobacco MosaicVirus (0))			
	absent		-	1[]
	present		-	9[]
5.9(ii) (48.2)	Resistance to Tobamovirus - Pathotype 1-2 (Tomato MosaicVirus (1-2))			
	absent		-	1[]
	present		-	9[]
	Resistance to Tobamovirus - Pathotype 1-2-3 (Pepper Mild Mottle Virus (1-2-3)	)		
	absent		-	1[]
	present		-	9[]
5.10 (49.1)	Resistance to Potato Virus Y (PVY Pathotype 0	() -		
	absent		-	1[]
	present		-	9[]

### 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	Characteristic(s) in	Describe the expression	Describe the
variety(ies) similar to	which your candidate	of the characteristic(s)	expression of the
your candidate variety	variety differs from the	for the similar	characteristic(s) for
	similar variety(ies)	variety(ies)	your candidate variety
Example	Fruit: color after first color change	yellow	red

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<sup>#</sup> 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 condition	ns for growing the vari	ety or conducting the examination?			
	Yes []	No [ ]				
	(If yes, please provide details)					
7.3	Other information					
8.	Authorization for release					
	(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?					
	Yes []	No [ ]				
	(b) Has such authorization b	een obtained?				
	Yes []	No []				
	If the answer to (b) is yes, plea	ase attach a copy of the	e authorization.			

<sup>&</sup>lt;sup>#</sup> Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

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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			tment (e.g. growth retardant, pesticide)		Yes []	No [ ]
	<ul><li>(c) Tissue culture</li><li>(d) Other factors</li></ul>				Yes []	No [ ]
					Yes []	No [ ]
	Please provide details for where you have indicated "yes".					
9.3 patho	9.3 Has the plant material to be examined been tested for the presence of virus or other bathogens?					
		Yes	[]			
	(please provide details as specified by the Authority)					
		No	[]			
10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:						
	Appli	icant's name				
	Signa	iture	D	Date		

[End of document]