nak tuinbouw

NARO 農研機構
National Agriculture and Food Research Organization

CALIBRATION MANUAL

Harmonized with

Naktuinbouw and NCSS(/NARO)

DUS Test for EGGPLANT

Solanum melongena L.

Established in January 15, 2019

Comply with UPOV TG/117/4

CALIBRATION MANUAL
DUS Test for EGGPLANT

Contents

1. Purpose
   This Calibration Manual was established by collaborative activities between Naktuinbouw (Netherlands) and NCSS (/NARO) (Japan).
   The purpose of this Calibration Manual is to harmonize technique of DUS examination in the two countries and use it also internationally.

2. Use of this Calibration Manual
   This Calibration Manual indicates only methods of observation for morphological characteristics included in UPOV Test Guidelines.

3. 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) Plant and leaf: all observations on the plant and leaf should be made after the first inflorescence starts to flower and before the start of the harvest.

   (b) Fruit: all observations on the fruit should be made on the first normally developed fruits.

4. Grouping characteristics:

The following have been agreed as useful grouping characteristics:

(a) Fruit: length (characteristic 16)

(b) Fruit: ratio length/maximum diameter (characteristic 18)

(c) Fruit: general shape (characteristic 19)

(d) Fruit: main color of skin at harvest maturity (characteristic 24)

(e) Fruit: stripes (characteristic 28)

(f) Fruit: color of flesh (characteristic 40)

5. Disclaimer
   The information contained in this Calibration Manual is for general information purposes only. The information is provided by Naktuinbouw and NCSS(/NARO) and while we endeavor to keep the information up to date and correct, we make no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability or availability with respect to the Calibration Manual or the information contained on the Calibration Manual for any

purpose. Any reliance you place on such information is therefore strictly at your own risk.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
1 (*)	**VG**	**Seedling: anthocyanin coloration of hypocotyl**				
QL		absent	Listada de Gandia		Shironasu	1
		present	Baluroi, Bonica			9

Remarks

Stage of observation: Seedling stage, at full development of cotyledons, when the first leaf begins to develop, before transplanting.

The presence of the anthocyanin coloration (redness) could be difficult to observe in an early stage (NL).

Method of observation: When the anthocyanin coloration is visible in the example varieties with the note ‘’present’’ it is possible to observe this characteristic.

Assess it as “present” if anthocyanin coloration (redness) of hypocotyl can be even slightly observed.

1
absent

9
present

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
2	**VG**	**Seedling: intensity of anthocyanin coloration of hypocotyl**				
QN		very weak	Whitegg		Black Beauty	1
		weak	Bonica		Tsudanaga	3
		medium	Baluroi		Kitta	5
		strong	Larga Morada		Wase Shinkuro	7
		very strong				9

Remarks

Stage of observation: Seedling stage, at full development of cotyledons, when the first leaf begins to develop, before transplanting.

The presence of the anthocyanin coloration (redness) could be difficult to observe in an early stage (NL).

Method of observation: Visual observation of the hypocotyl of a plant before transplanting. The intensity of anthocyanin coloration is influenced by the environmental factor (e.g. sunlight, temperature). Compare with the example varieties to decide on the proper notes.

The intensity of the anthocyanin coloration (the intensity of redness) could be difficult to observe in an early stage due to the higher temperatures during and just after the germination stage. When the intensity does not show sufficient variation between the different varieties it is also possible to observe the intensity of anthocyanin coloration when the first leaves are starting to develop (NL).



Compare with the example varieties to decide on the proper notes.

Too early stage of observation: Seedling stage when the intensity does not show sufficient variation between the different varieties. Do not observe the intensity of anthocyanin (redness) coloration but wait until the variation is visible (NL).

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
3 (*)	**VG**	**Plant: growth habit**				
QN		erect	Baluroi, Pingtung Long, Purpura Violetta Lunga 2		Wase Shinkuro	1
		semi-erect	Bonica, Ovana		Kitta	3
		horizontal	Black Bell, Irene, Listada de Gandia, Slim Purple		Mogi	5

Remarks: Under Dutch growing circumstances it is not possible to observe plant growth habit since plants are guided along ropes hanging from an overhead wire.

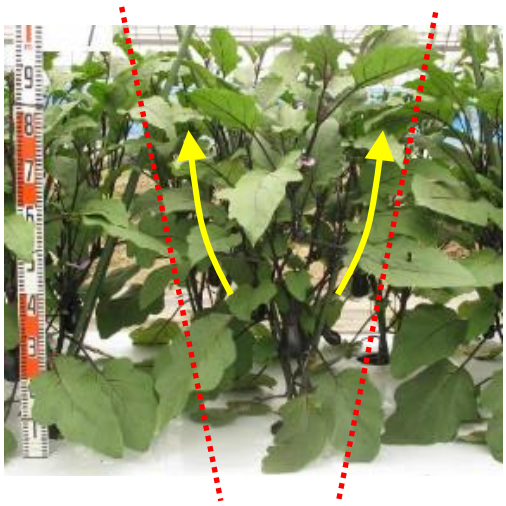
Stage of observation: All observations on the plant should be made after the first inflorescence starts to flower and before the start of the harvest.

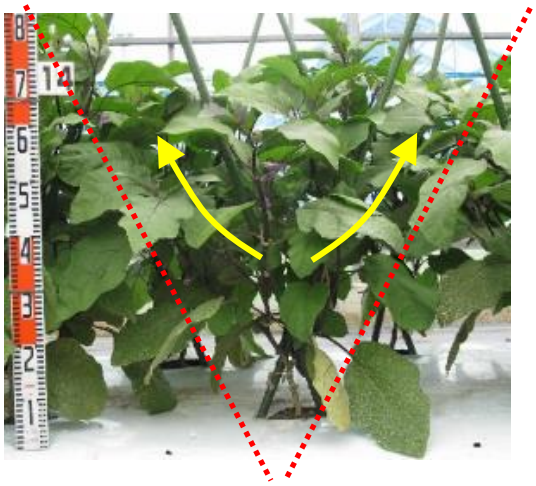
At the beginning of the harvest, when 50% of the plants of the variety bear normally developed fruits (JP).

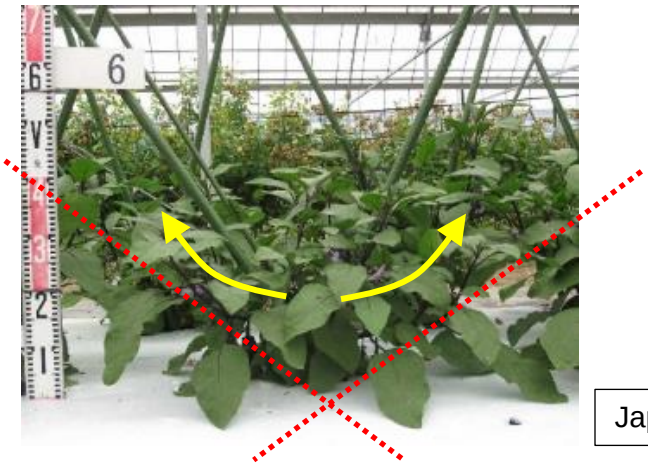
(See the way to discriminate the appropriate fruits to harvest in Cha.16.)

Method of observation: Visual observation. Compare with the example varieties to decide on the proper notes. Consider the attitude of the extending and spreading of branches.

Dutch growing circumstances







Japanese growing circumstances

Yellow arrows show the direction to extend of branches. Red lines show the spreading of branches. These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
4	**MS/ VG**	**Plant: height**				
QN		very short				1
		short	Adona, Monstrueuse de New York, Whitegg		Mogi	3
		medium	Short Tom, Tudela		Kitta	5
		tall	Avan, Baluroi		Hakatanaga	7
		very tall	Nilo			9

Remarks

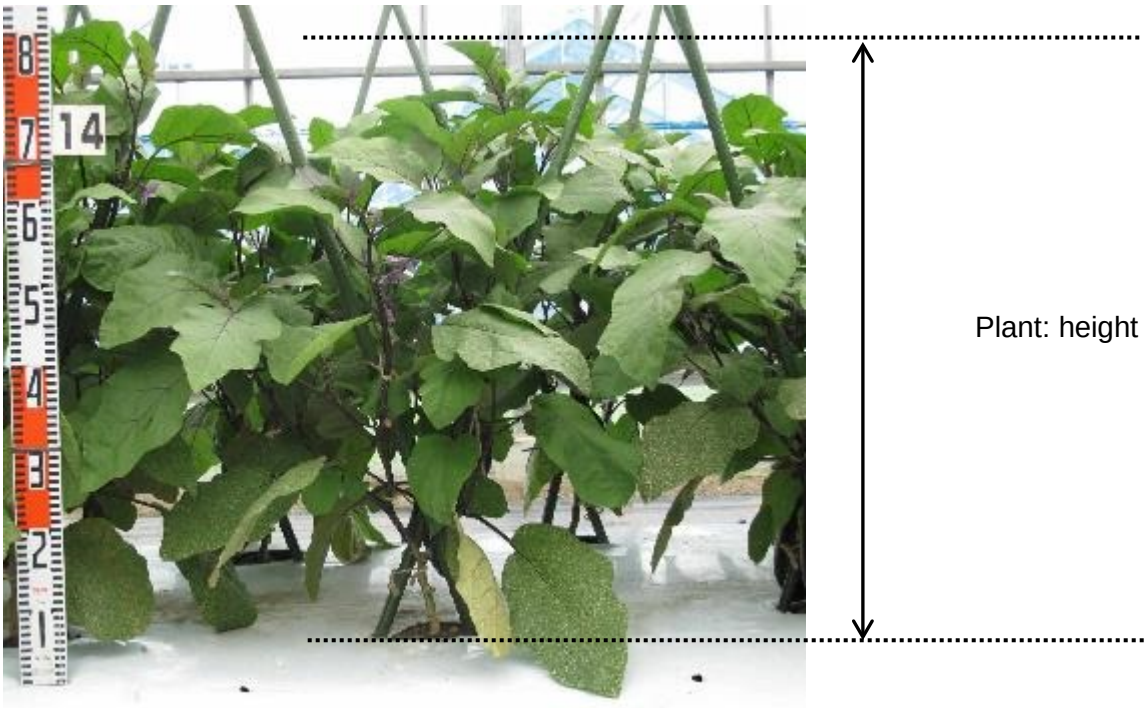
Under Dutch growing circumstances it is not possible to observe plant height since plants are guided along ropes hanging from an overhead wire. (see picture at char. 3)

Stage of observation: All observations on the plant should be made after the first inflorescence starts to flower and before the start of the harvest, since the development of the fruits will influence the vegetative growth of the plants.

At the beginning of the harvest. (When 50% of the test plants of the variety bore normally developed fruits.) (See the way to discriminate the appropriate fruits to harvest in Cha.16.) (JP)

Method of observation: Visual observation of the average height of the plants (VG). Compare with the example varieties to decide on the proper notes.

This characteristic can also be assessed by measuring the natural height from the base to the top of the plant (MS). See the picture below.


Plant: height

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
5	**MS/ VG**	**Stem: distance from cotyledons to the node of the first flower**				
QN		very short	Ova			1
		short	Dourga		Mogi	3
		medium	Bonica		Kitta	5
		tall	De Barbentane		Hakatanaga	7
		very tall	Nilo			9

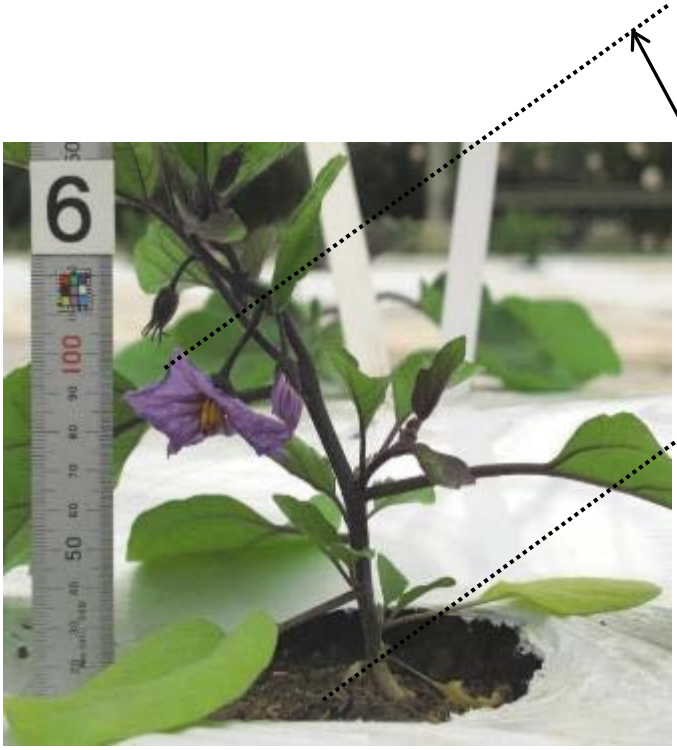
Remarks

Stage of observation:

At the stage of the flowering of the first inflorescence, when 50% of the plants of the variety flowers.

Method of observation: Visual observation of a representative plant (VG). Observe the height of the node of the first flower. Compare with the example varieties to decide on the proper notes. In some climatic conditions the plant sometimes aborts a few flowers, therefore it is very important to monitor on the developing inflorescence until this characteristic has been observed to make sure that the observation is done on the right node.

This characteristic can also be assessed by measuring the distance from the cotyledons to the node of the first flower (MS).


distance from
cotyledons to the node
of the first flower


distance from
cotyledon to the
node of the first
flower

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
6 (*)	**VG**	**Stem: anthocyanin coloration**				
QL		absent	Whitegg			1
		present	Baluroi			9

Remarks

Stage of observation: Observations on the plant should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation at the upper third of the plant. Compare with the example varieties to decide at the proper notes.

Remove the hairs of the stem if necessary, if the plants have too many hairs to observe if the anthocyanin coloration (redness) is ‘’present’’ but ‘’very weak or absent’’. If it is necessary to remove the hairs, make sure that characteristic 8 ‘’stem pubescence’’ has been observed.

All sides of the stem are being observed since sunlight can have an influence on the intensity of the anthocyanin coloration.

Assess it as “present” if anthocyanin coloration (redness) of stem can be even slightly observed. In case that the intensity of anthocyanin coloration is not shown at the upper third but at the other part, it should be considered as very weakly present.

If the anthocyanin coloration is shown on more than 50% of the plants of the variety, it might be judged as “present” according to the consideration about the influence of the cultivation condition. But be aware of a possible uniformity problem.

1
absent

9
present

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
7	**VG**	**Stem: intensity of anthocyanin coloration**				
QN		very weak			Black Beauty	1
		weak	Bonica		Tsudanaga	3
		medium	Baluroi		Kitta	5
		strong	Redonda de Valencia, Short Tom		Wase Shinkuro	7
		very strong				9

Remarks

Stage of observation: Observations on the plant should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation at the upper third of the plant. Compare with the example varieties to decide on the proper notes.

Remove the hairs of the stem if necessary, if the plants have too many hairs to observe if the anthocyanin coloration (redness) is ''present'' but ''very weak or absent''. If it is necessary to remove the hairs, make sure that characteristic 8 ''stem pubescence'' has been observed.

All sides of the stem are being observed since sunlight can have an influence on the intensity of the anthocyanin coloration (NL).

In case that the intensity of anthocyanin coloration is not shown at the upper third but at the other part, it should be considered as very weakly present.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference (JP).

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference (NL).

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
8	**VG**	**Stem: pubescence**				
QN		weak	Baluroi, Black Oval		Wase Shinkuro	3
		medium	Abrivado, Bonica		Kitta	5
		strong	Bolan, Estival, Mistral		Sadowaranaga	7

Remarks

Stage of observation: Observations on the plant should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation at the middle third of the plant (NL) or at the middle part of the longest primary branch (JP). Compare with the example varieties to decide on the proper notes.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference (JP).

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference (NL).

6. Method of observation (example of characterization)

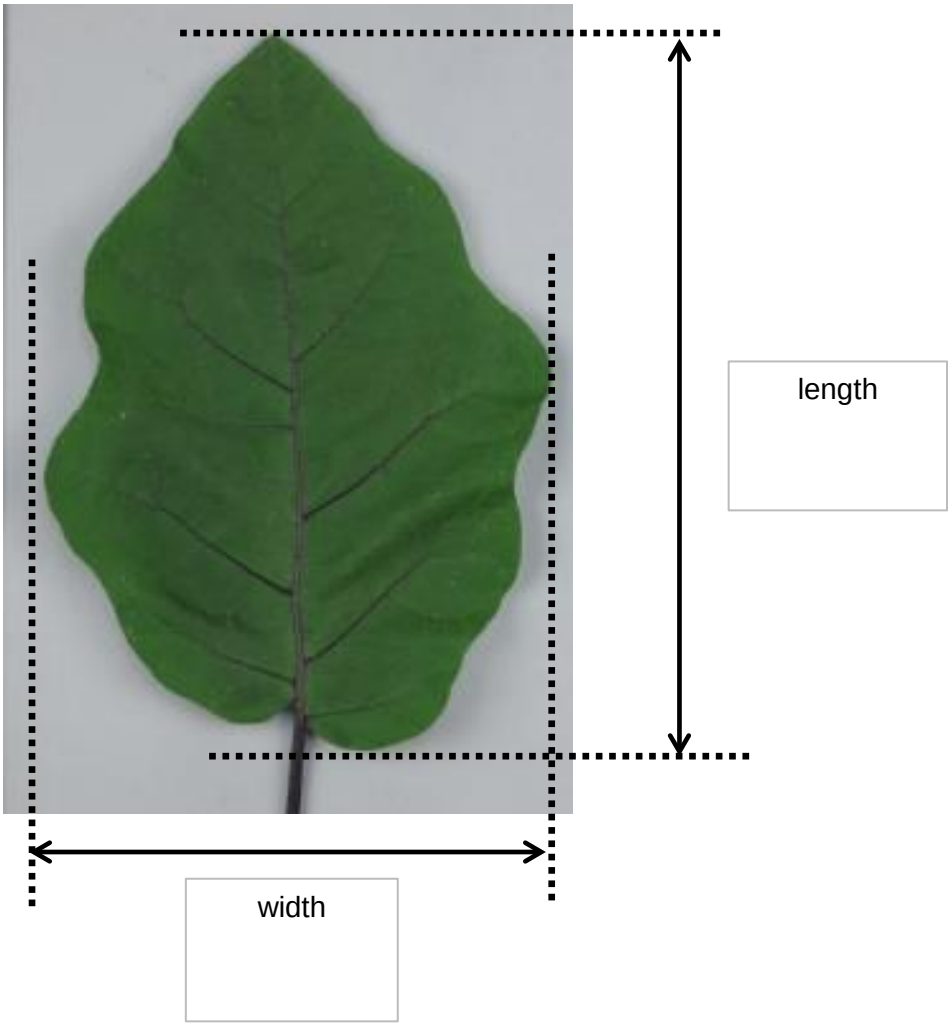
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
9	**VG**	**Leaf blade: size**				
QN		very small				1
		small	Short Tom		Mogi	3
		medium	Baluroi		Kitta	5
		large	Bonica			7
		very large	Morisca			9

Remarks

Stage of observation: Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation. Observations should be made at the middle third part of the plant. Observe the total surface of the leaves to determine the size. Compare with the example varieties to decide on the proper notes.

Consider measuring length and width, for reference (not an absolute measurement) when compare with the example varieties.


length
width

6. Method of observation (example of characterization)

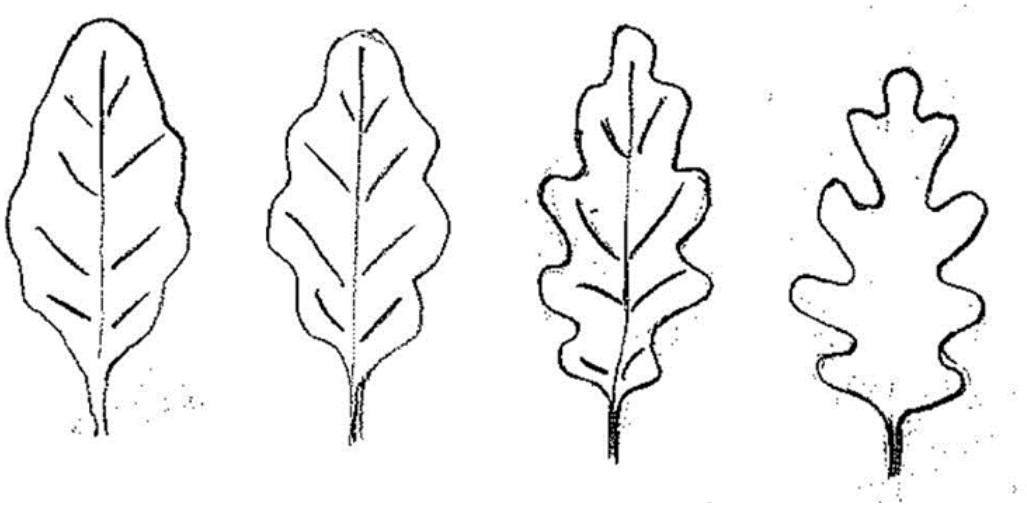
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
10	**VG**	**Leaf blade: sinuation of margin**				
QN		absent or very weak	Baluroi, Bonica			1
		weak	Adria			3
		medium	Epic, Fabiola		Kitta	5
		strong	Dalia, Niteking, Tosca			7
		very strong				9

Remarks

Stage of observation: Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation. Observations should be made at the middle third of the plant.

Sinuation of margin is a kind of lobing (but not entirely unto the midrib) which arises from incision of the leaf margin. It must be explained that it does not involve undulation of the margin.



1. absent or very weak 3. weak 5. medium 7. strong

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

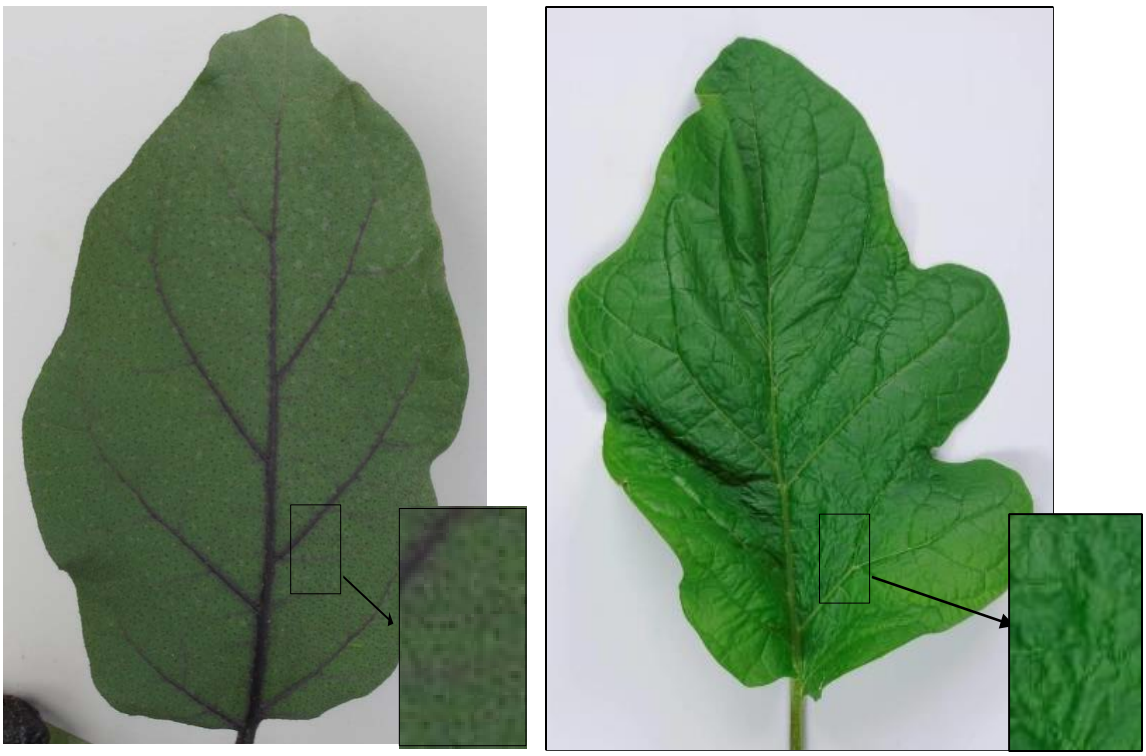
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
11	**VG**	**Leaf blade: blistering**				
QN		absent or very weak	Baluroi			1
		weak	Ritmo			3
		medium	Bonica			5
		strong	Oria			7
		very strong				9

Remarks

Stage of observation: Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation. Observations should be made at the middle third of the plant. Be sure to describe the actual blistering and not the creasing of the leaf blade.

Check the registered varieties and consider them as standard for reference.



These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
12	**VG**	**Leaf blade: intensity of green color**				
QN	**(c)**	light				3
		medium				5
		dark				7

Remarks

Stage of observation: Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation: Visual observation. Observations should be made at the middle third of the plant. Compare with the example varieties to decide on the proper notes.

Check the registered varieties and consider them as standard for reference.

6. Method of observation (example of characterization)

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
13	**MS/ VG**	**Inflorescence: number of flowers**				
PQ		one to three				1
QL						
		more than three	Whitegg			2

Remarks

Stage of observation: When 50% of the plants of the variety has opened flowers on the second or the third inflorescence.

Method of observation: Visual observation. Count the number of flowers (including flower buds) per inflorescence (VG). Calculate the mean if needed (MS).

In certain varieties both expressions ‘’one to three’’ and ‘’more than three’’, will be found. In that case the expression that is most common within the plant is the correct expression. In some climatic conditions the plant sometimes aborts a few flowers, therefore it is very important to monitor the developing inflorescence until this characteristic has been observed.

1
one to three

2
more than three

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
14	**MS/ VG**	**Flower: size**				
QN		small	Cima viola		Mogi	3
		medium	Violetta di new York		Kitta	5
		large	Prosperosa			7

Remarks

Stage of observation: When 50% of the plants of the variety has opened flowers on the second or the third inflorescence. Observe the fresh, fully opened first flower of the second or third inflorescence.

Method of observation: Visual observation (VG) or measurement of the largest diameter of the flower (MS). Flowers that start to wilt appear smaller, therefore it is important to observe fresh flowers. Compare with the example varieties to decide on the proper notes.

In certain climatic conditions the plant sometimes aborts a few flowers, therefore it is very important to monitor on the developing inflorescence until this characteristic has been observed. If the first flower of the second inflorescence has been aborted, the third inflorescence can be used.

the largest diameter of flower

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
15	**VG**	**Flower: intensity of purple color**				
QN		light	Listada de Gandia			3
		medium	Baluroi		Kitta	5
		dark	Redonda Negra			7

Remarks

Stage of observation: When 50% of the plants of the variety has opened flowers on the second or the third inflorescence. Observe the fresh, fully opened first flower of the second or third inflorescence.

Method of observation: Visual observation. The intensity of the purple color changes after the flower starts to wilt, therefore it is important to observe fresh flowers. Compare with the example varieties to decide on the proper notes.

In certain climatic conditions the plant sometimes aborts a few flowers, therefore it is very important to monitor on the developing inflorescence until this characteristic has been observed. If the first flower of the second inflorescence has been aborted, the third inflorescence can be used.

Some varieties have white flowers, in that case the expression of this characteristic cannot be observed. Put ”white” as a remark in the description.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
16 (*)	**MS/ VG**	**Fruit: length**				
QN		very short	Whitegg			1
		short	Birgah			3
		medium	Cava			5
		long	Mistral			7
		very long	Indira, Slim Purple			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

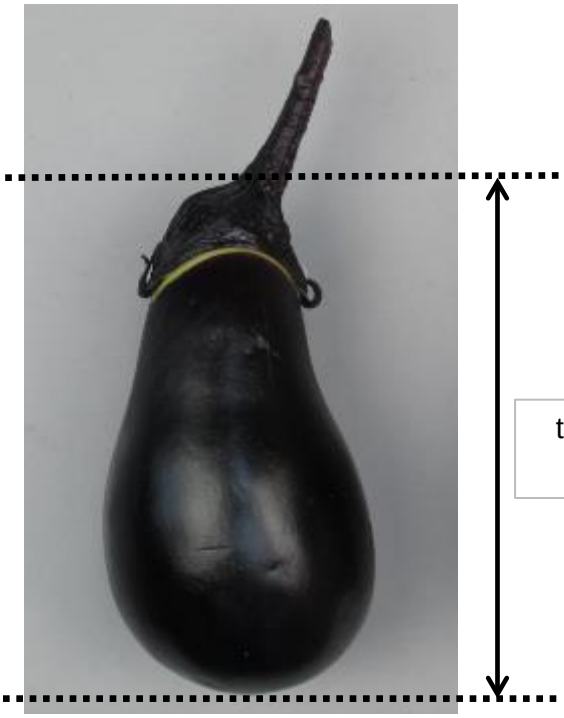
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation (VG) or measurement of the length (the longest part) of the harvested fruits (MS). Observe the harvested fruits. Compare with the example varieties to decide on the proper notes.

The maximum diameter and the shape of the fruit can give a wrong impression of the length of the fruits. A globular shaped fruit with a large maximum diameter can appear shorter than a cylindrical shaped fruit with the same length and a small maximum diameter.



1. very short 3. short 5. medium 7. long 9. very long

Note that the scale can differ depending on the growing conditions.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
17	**MS/ VG**	**Fruit: maximum diameter**				
QN		very small	Slim Purple, Whitegg		Mogi、Minden	1
		small	Mistral, Indira		Sendainaga	3
		medium	Cava		Kitta, Kumamotonaga	5
		large	Bonica		Oserigawa	7
		very large	Birgah			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

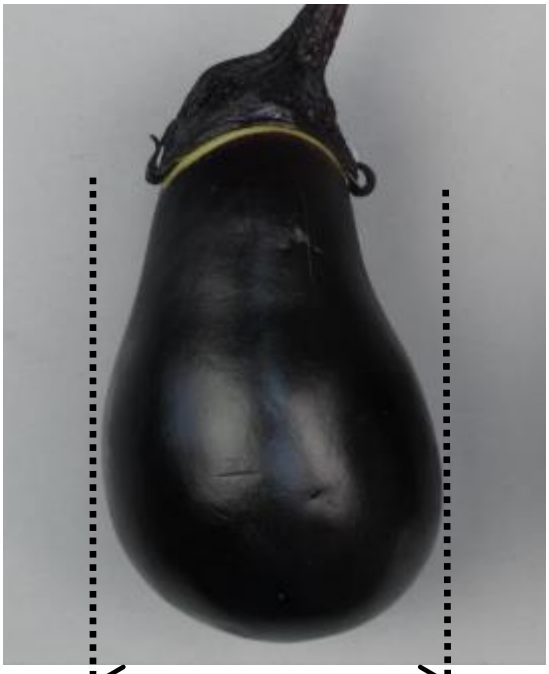
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation (VG) or measurement of the maximum diameter (the widest part) of the harvested fruit (MS). Observe the harvested fruits. Compare with the example varieties to decide on the proper notes.

The maximum diameter and the shape of the fruit can give you a wrong impression of the diameter of the fruits. A globular shaped fruit with a large maximum diameter can appear broader than a cylindrical shaped fruit with the same length and a small maximum diameter.



1. very small 3. small 5. medium 7. large 9. very large

Note that the scale can differ depending on the growing conditions.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
18 (*)	**MS/ VG**	**Fruit: ratio length/maximum diameter**				
QN		very small	Birgah, Kermit			1
G		small	Bonica			3
		medium	Cava			5
		large	Mistral			7
		very large	Indira, Slim Purple			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation (VG) of the harvested fruits or calculation of the ratio of measured fruit length compared with the measured maximum diameter (the widest part) of fruits (MS).

1. very small 3. small 5. medium 7large 9 very large

Note that the scale can differ depending on the growing conditions.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
19 (*) (+)	**VG**	**Fruit: general shape**				
PQ		globular	Kermit, Purpura, Violetta di New York			1
G		ovoid	Beatrice, Whitegg			2
		obovate	Black King, Oria			3
		pear shaped	Listada de Gandia			4
		club shaped	Baluroi, Mileda, Solara			5
		ellipsoid	Volta			6
		cylindrical	Mirabelle, Slim Purple, Tango			7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

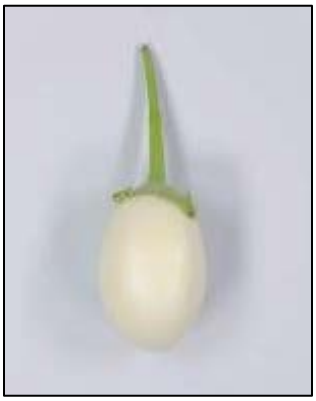
How to distinguish the appropriate fruits to harvest:

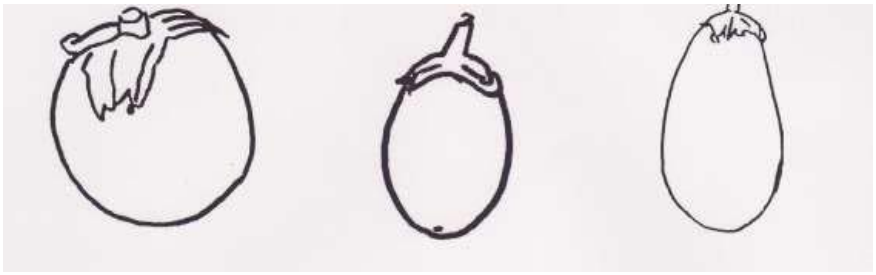
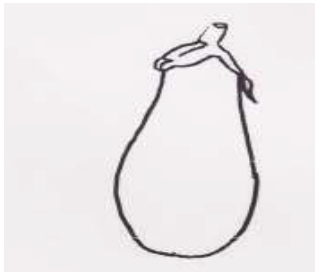
1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Observe the harvested fruits. Some varieties show different shape than mentioned in this characteristic (flattened globular for example, length is shorter than width). Put this shape as a remark in the description.

flattened globular

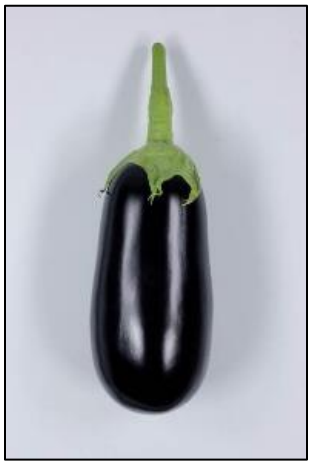



1
globular

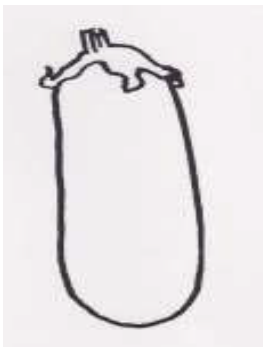
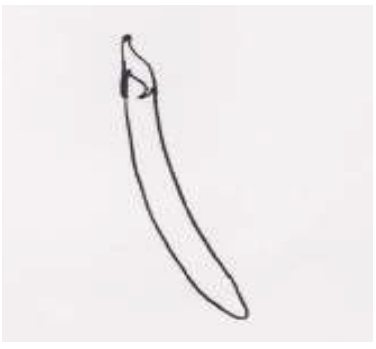
2
ovoid

3
obovate

4
pear shaped
(Constricted and swell up from the middle part.)



5. club shaped
(Calyx side is thin and swelling up at apex or toward apex.)

6
ellipsoid
(No constriction and thick from calyx to apex.)

7
cylindrical
(Long and narrow. no or less swelling at apex.)

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
20	**VG**	**Fruit: size of pistil scar**				
QN		very small	Whitegg			1
		small	Baluroi		Wase Shinkuro	3
		medium	Bonica		Kitta	5
		large	Semi Redonda Negra		Uonuma Kinchaku	7
		very large	Purpura			

Remarks

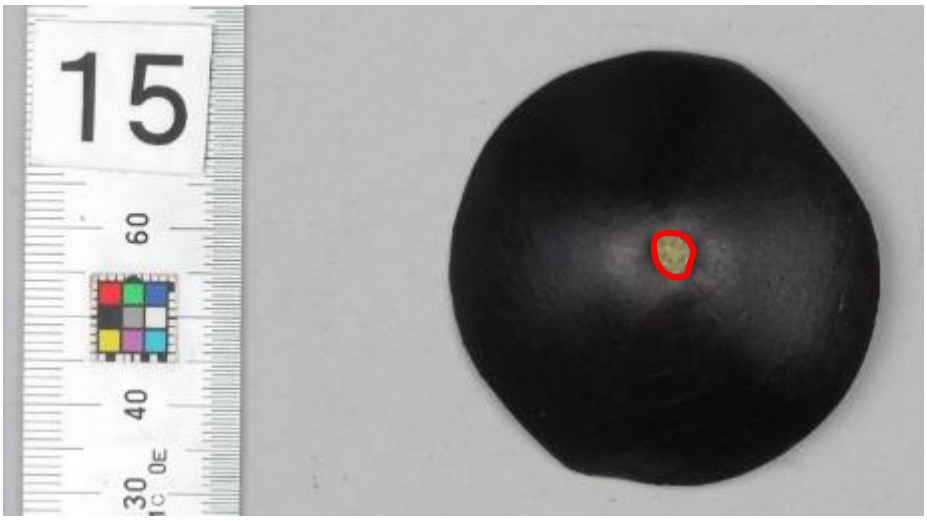
Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

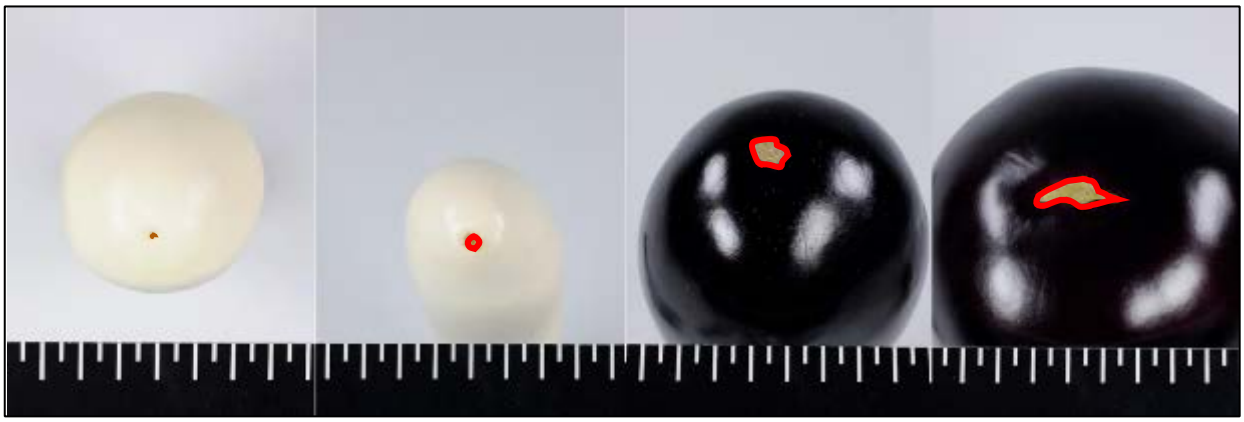
1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Observe the total area of the pistil scar. Compare with the example varieties to decide on the proper notes. Consider measurement of the total area of the pistil scar, for reference (not an absolute measurement).



the total area



Note that the scale can differ depending on the growing conditions.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
21 (+)	**VG**	**Fruit: apex**				
PQ		indented				1
		flattened	Prosperosa			2
		rounded	Baluroi			3
		pointed	Short Tom, Slim Purple			4

Remarks

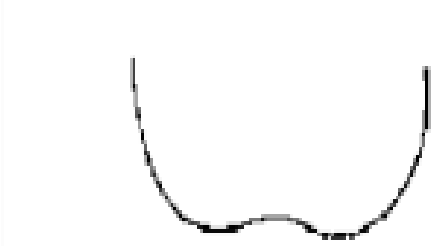
Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

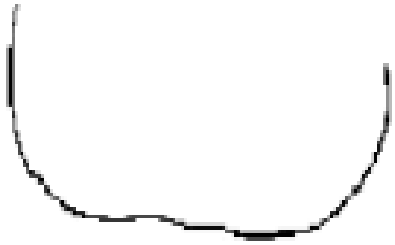
1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

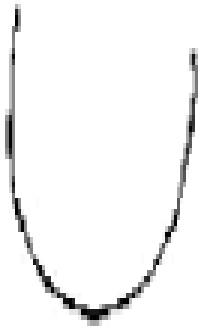
Method of observation: Visual observation.



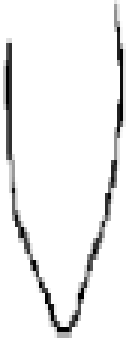
1
indented



2
flattened



3
rounded



4
pointed

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
22	**VG**	**Fruit: depth of indentation of pistil scar**				
QN		shallow				3
		medium				5
		deep				7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation.

Check the registered varieties and consider them as standard for reference.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
23	**VG**	**<u>Only for varieties with cylindrical fruits</u>: Fruit: curvature**				
QN	**(d)**	weak				3
		medium				5
		strong				7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation, only for the varieties with cylindrical fruits. Observe not only from the middle part to the apex, but the whole fruit. Compare with the example varieties to decide on the proper notes.

Observe the fruits that have been growing without any obstacles since that can affect the curvature. For example, fruits that have been resting on a node, stem, branch or ground or have been stuck between the wire can be deformed and therefore have a stronger curvature.

Check the registered varieties and consider them as standard for reference.

1
absent or very weak

3
weak

5
medium

7
strong

9
very strong

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
24 (*)	**VG**	**Fruit: main color of skin at harvest maturity**				
PQ		white		Dourga	Koshienzairai	1
QL		green		Kermit	Shironasu	2
G		violet		Baluroi, Purpura		3

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. As for the varieties with stripes on the fruits, the color which occupies the largest area on the fruit is regarded as main color. In case that the two colors occupy same area, the darker color is regarded as main color. Compare with the example varieties to decide on the proper notes.

1.
White

2
green

3
violet

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
25	**VG**	**Only for varieties with green and violet skin color: Fruit: intensity of main color of skin (as for 24)**				
QN	**(d)**	very light			Tsudanaga	1
		light	Bride		Yamashina	3
		medium	Purpura		Kitta	5
		dark			Senryo Nigo	7
		very dark	Faselis		Shizuoka 11go	9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation, only for varieties with green and violet skin color. This characteristic should be observed as soon as possible after the harvesting, because of the influence of direct sunlight older fruits can start to discolor. The degree of the glossiness and the different shades of the main color can influence the observations. Compare with the example varieties to decide on the proper notes.

These images serves only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
26	**VG**	**Fruit: glossiness (as for 24)**				
QN		weak	Short Tom		Minden	3
		medium	Baluroi		Kitta	5
		strong	Elisa		Shizuoka 11go	7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. This characteristic should be observed as soon as possible after the harvesting, because of the influence of direct sunlight older fruits can start to discolor. The degree of the glossiness and the different shades of the main color can influence the observations. Compare with the example varieties to decide on the proper notes.

1
very weak

3
weak

5
medium

7
strong

9
very strong

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
27 (+)	**VG**	**Fruit: patches**				
PQ		absent	Baluroi		Kitta	1
QL		present	Kermit			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. This characteristic should be observed as soon as possible after harvest, older fruits can appear to be patched, when in fact they are starting to discolor. The patches are present and not a result from discoloration, it can be helpful to check younger fruits on the plants.

CPVO / UPOV explanation:

Overripe fruit which appears to have patches but is in fact discoloring

1. absent

9. present

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
28 (*) (+)	**VG**	**Fruit: stripes**				
QL		absent	Baluroi			1
G		present	Bandera			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

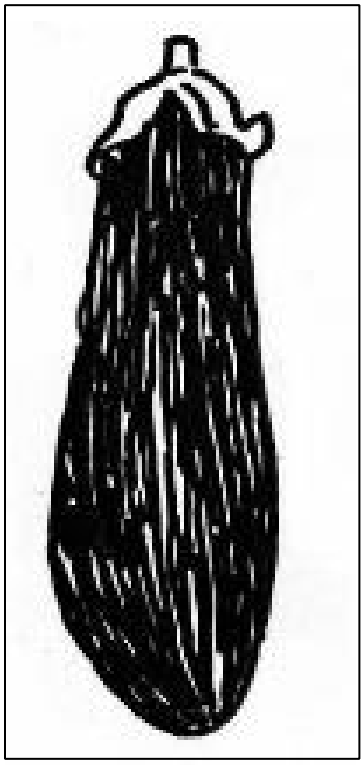
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation.

CPVO explanation:



1. absent

9 . present

Broad stripes type

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
29 (+)	**VG**	**Fruit: prominence of stripes**				
QN	**(d)**	weak	Bride			3
		medium				5
		strong	Bandera			7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation, only for the varieties with stripes. This characteristic should be observed as soon as possible after the harvesting, the color of the fruits can start to fade when aging, making the stripes less clear. Compare with the example varieties to decide on the proper notes.

Broad stripes type

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
30	**VG**	**Fruit: density of stripes**				
QN		sparse				3
		medium				5
		dense	Bandera			7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. This characteristic should be observed as soon as possible after the harvesting, the color of the fruits can start to fade when aging, making the stripes less clear. Compare with the example varieties to decide on the proper notes.

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

6. Method of observation (example of characterization)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
31 (*)	**VG**	**Fruit: ribs**				
QN		very weak	Bonica, Reina Negra			1
		weak	Bibo			3
		medium	Redonda Morada			5
		strong	Black Beauty			7
		very strong				9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Compare with the example varieties to decide on the proper notes.

Check the registered varieties and consider them as standard for reference.

1
absent to very weak

3
weak

5
medium

7
strong

9
very strong

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
32	**MS/ VG**	**Fruit: length of peduncle**				
QN		very short	Golden Eggs			1
		short	Globo			3
		medium	Madonna			5
		long	Telar			7
		very long	Adria, Avan			9

Remarks

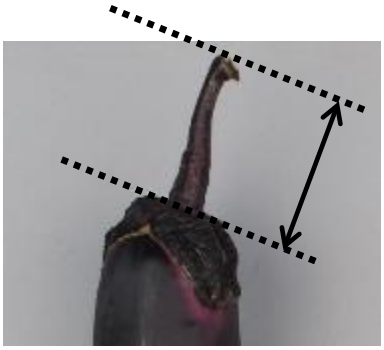
Stage of observation: Observations should be made on the first normally developed fruits.

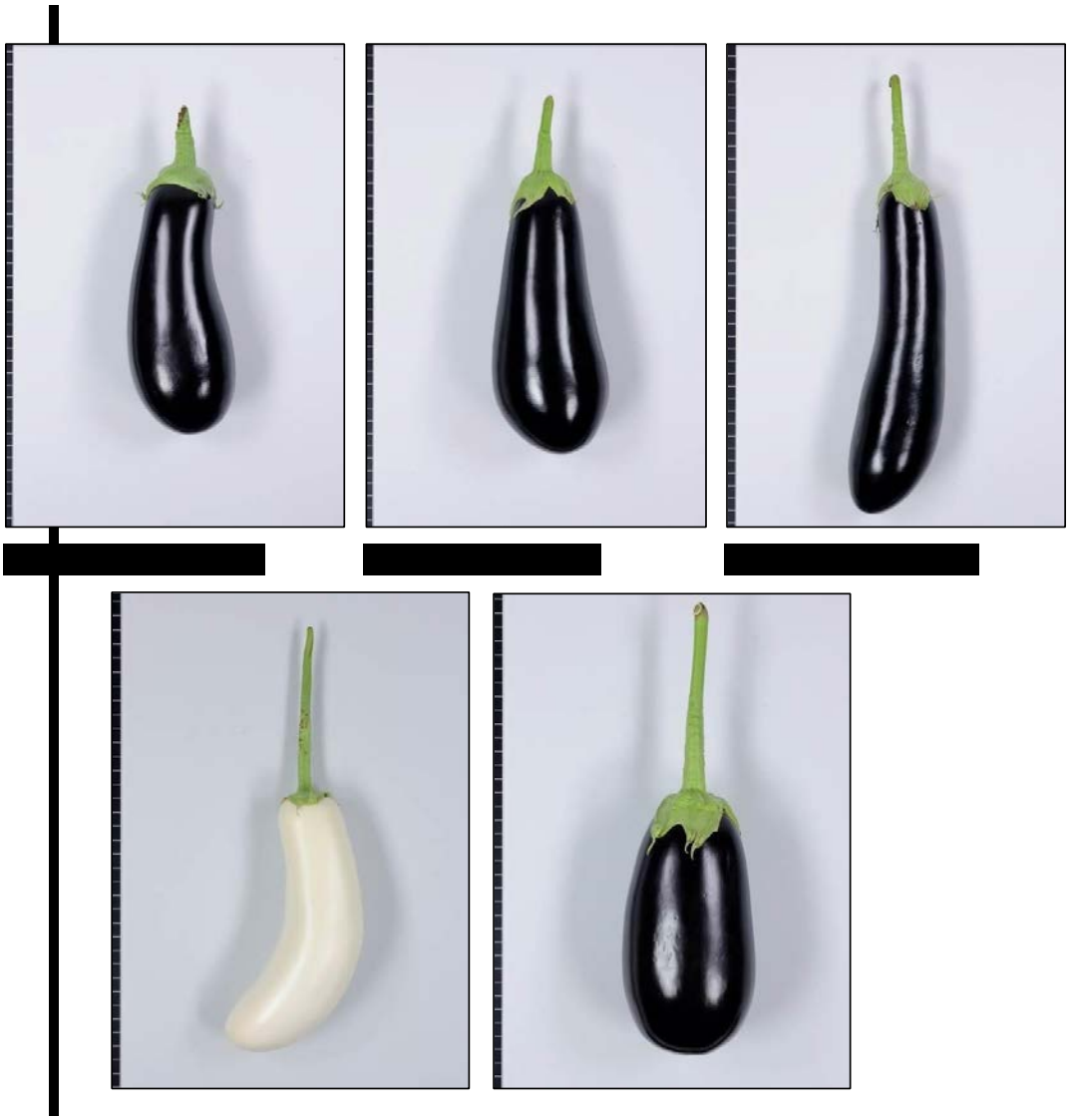
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation of the total length of the peduncle (VG) or measurement of the total length of peduncle (MS). The fruits are cut from the plant as closely to the stem as possible. Compare with the example varieties to decide on the proper notes.





7. long

9. very long

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
33 (*)	**VG**	**Fruit: anthocyanin coloration underneath calyx**				
QL		absent	Pingtung Long, Ronde de Valence			1
		present	Baluroi			9

Remarks

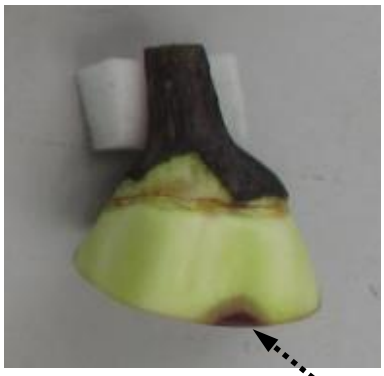
Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

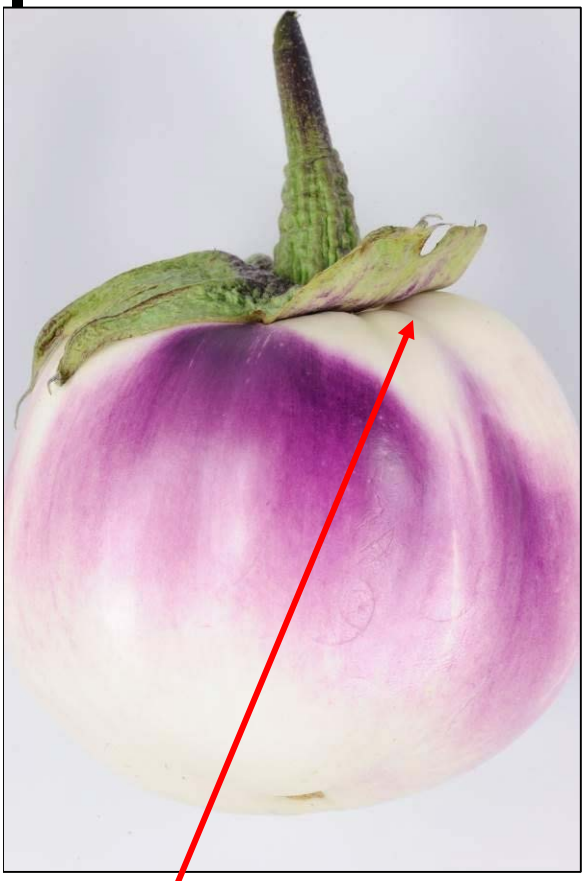
Method of observation: Visual observation. Lift or peel the calyx from the fruit to be able to observe the anthocyanin on the fruit underneath the calyx. Assess it as “present” if anthocyanin coloration (redness) underneath calyx can be even slightly observed. Compare with the example varieties to decide on the proper notes.

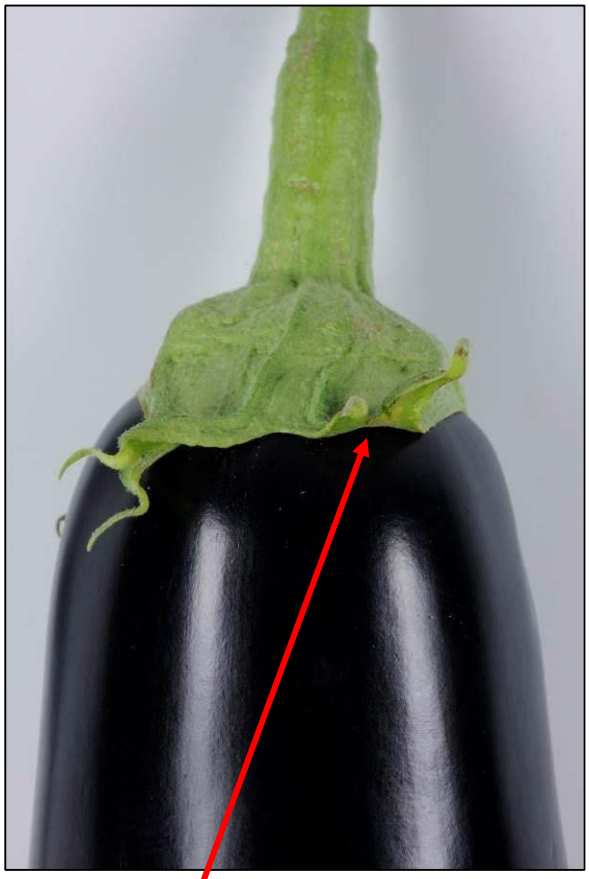


1
absent

Violet color is the part without calyx covering.

9
present





		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
34	**VG**	**Fruit: intensity of anthocyanin coloration underneath calyx**				
QN		weak	Short Tom			3
		medium	Black Beauty			5
		strong	Baluroi			7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation, only for the varieties with anthocyanin coloration underneath calyx. Observe this characteristic at the same time as the intensity of main color of skin and use the same scale. Lift or peel the calyx from the fruit to be able to observe the anthocyanin on the fruit underneath the calyx. Meaning if the intensity of the main color of the fruit is ‘’dark’’ and the intensity at the color underneath the calyx is the same, then this should also be ‘’dark’’. Compare with the example varieties to decide on the proper notes.

Check the registered varieties and consider them as standard for reference.



These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
35	**VG**	**Fruit: size of calyx**				
QN		very small	Whitegg			1
		small	Dourga		Shizuoka 11go	3
		medium	Baluroi		Kitta	5
		large	Larga Morada		Otoshi	7
		very large	Solara			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

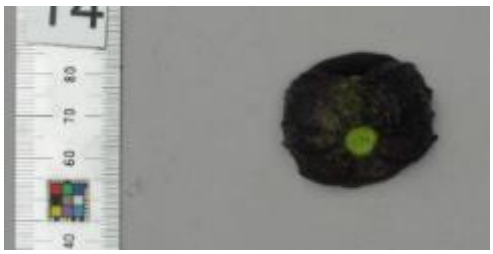
Method of observation: Visual observation of a combination of the upper part and the side part of the calyx. Compare with the example varieties to decide on the proper notes.

The size of calyx is not relative to the size of the fruit but absolute.

Side part

upper part

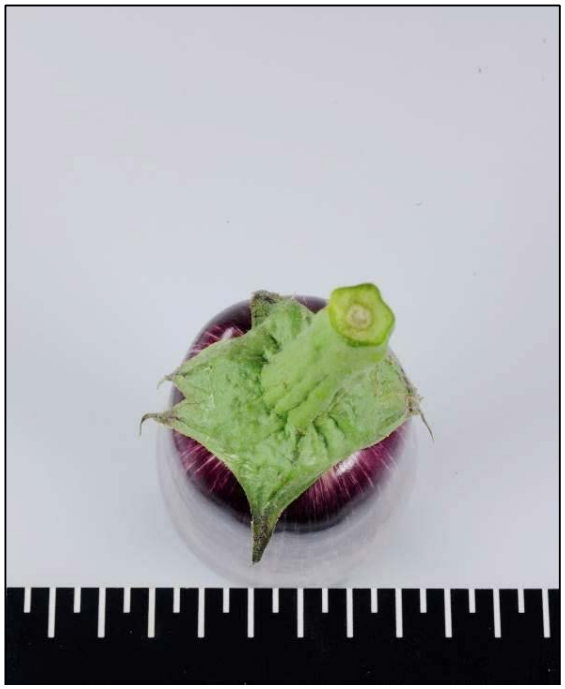
3
small



5
medium

7
large

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.



5. medium

8. large to very large

These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
36 (*)	**VG**	**Fruit: anthocyanin coloration of calyx**				
QL		absent	Whitegg			1
		present	Short Tom			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

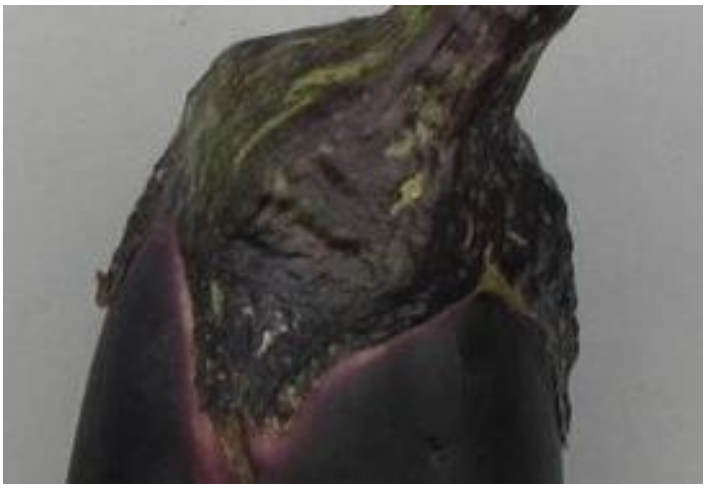
1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation.

Check the registered varieties and consider them as standard for reference.

1. absent



9. present

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
37	**VG**	**Fruit: intensity of anthocyanin coloration of calyx**				
QN		very weak	Dourga		Black Beauty	1
		weak	Baluroi		Tsudanaga	3
		medium	Mileda		Kitta	5
		strong	De Barbentane		Wase Shinkuro	7
		very strong	Ronde de Valence, Short Tom			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

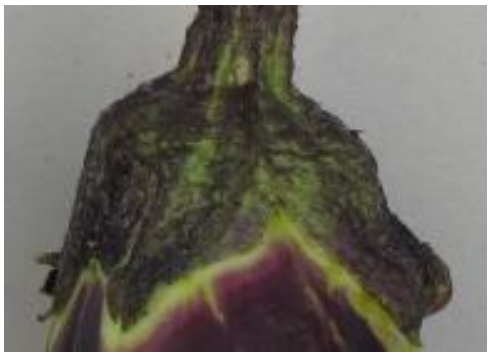
How to distinguish the appropriate fruits to harvest:

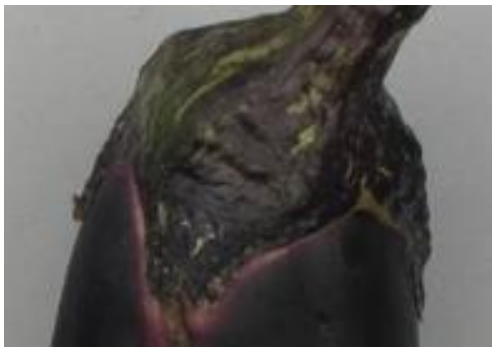
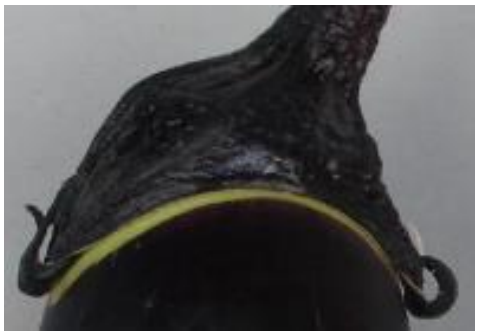
1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Observe the intensity of anthocyanin of calyx of the first normally developed fruit (on the second or the third fruit bunch). Compare with the example varieties to decide on the notes properly.



These images serve only to illustrate the variation present in the crop and should not be used as an absolute reference.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
38 (*) (+)	**VG**	**Fruit: spininess of calyx**				
QN		absent or very weak	Freia			1
		weak	Bonica			3
		medium	Baluroi			5
		strong	Bibo			7

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

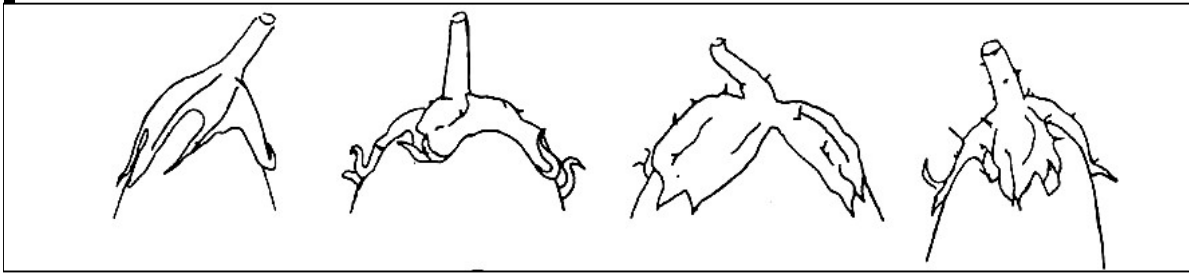
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. The intensity is a combination of the density and the size of the spines. Compare with the example varieties to decide on the proper notes. When there is doubt if the spininess is present, check the calyx on the fresh flower.

[redacted]



1. absent or very weak 3. weak 5. medium 7. strong

1 absent or very weak

3 weak

5 medium

7 strong

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
39	**VG**	**Fruit: creasing of calyx**				
QN		very weak				1
		weak	Telar			3
		medium	Bonica			5
		strong	Talina			7
		very strong	Linda			9

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

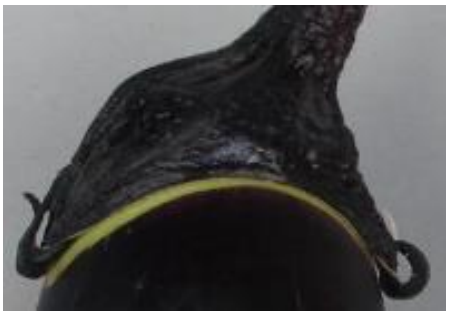
How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Compare with the example varieties to decide on the proper notes.

Check the registered varieties and consider them as standard for reference.








		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
40 (*)	**VG**	**Fruit: color of flesh**				
PQ		whitish	Dourga			1
G		greenish	Baluroi			2
		yellow				3
		orange				4
		red				5
		others				6

Remarks

Stage of observation: Observations should be made on the first normally developed fruits.

How to distinguish the appropriate fruits to harvest:

1. Cut some fruits (not all fruits) and check the starting seed development inside. The fruits having seeds beginning the formation could be regarded as appropriate fruit to harvest.

2. Harvest more fruits according to the appropriate size and stage of requirement 1.

Method of observation: Visual observation. Cut the fruits in half in the cross section and leave them for 3 minutes before observing the color of the flesh. Compare with the example varieties to decide on the proper notes.

Do not assess the color of direct underneath of the skin.

1. whitish

2. greenish

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
41	**VG**	**Fruit: color of skin <u>at physiological ripeness</u>**				
PQ		yellow	Dourga			1
G		orange	Comprido Verde Claro			2
		ochre	Adria, Vernal			3
		brown	Baluroi, Abrivado			4
		red				5
		purple				6
		others				7

Remarks

Only JP

Stage of observation: Observations should be made on the physiological ripeness fruits. (When the first normally developed fruit get full ripe, the color of skin stops changing and the fruit has the specific smell of full ripeness.)

Method of observation: Visual observation.

Check the registered varieties and consider them as standard for reference.

1
yellow

3
ochre

4
brown

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
42 (*)	**MS**	**Time of beginning of flowering**				
QN		early	Prelane			3
		medium	Bonica			5
		late	Monstrueuse de New York			7

Remarks

Stage of observation:

When the first flower of 50% of the plants open (JP).

When 80% of the plants have 2 or more open flowers (NL).

Method of observation: Record the date of beginning of flowering. Since the flowering can go very fast in certain circumstances, the observations should be made every other day when the weather is warm and sunny. When all varieties have started to flower the dates can be compared to the dates on which the example varieties started to flower, so they can be converted in to the proper notes. In some/certain climatic conditions the plant sometimes aborts a few flowers, therefore it is very important to monitor on the developing inflorescence until this characteristic has been observed.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
43	**MS**	**Time of physiological ripeness**				
QN		early	Dourga, Prelane			3
		medium	Bonica			5
		late	Monstrueuse de New York			7

Remarks

Only JP

Stage of observation: At the stage of physiological ~~full~~ ripeness. (When the first normally developed fruit get full ripe, the color of skin stops changing and the fruit has the specific smell of full ripeness.)

Method of observation: Record the date of physiological ripeness.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
44	**VG**	**Stem: spininess**				
QL		absent			Shousha	1
		present			Kitta	9

Remarks

Only JP

Stage of observation:

Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation:

Observe the whole stem of the plants. Even if the variety has only a few spines, assess it as “present”.

9
present

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
45	**VG**	**Leaf blade: spininess**				
QL		absent			Shousha	1
G		present			Kitta	9

Remarks

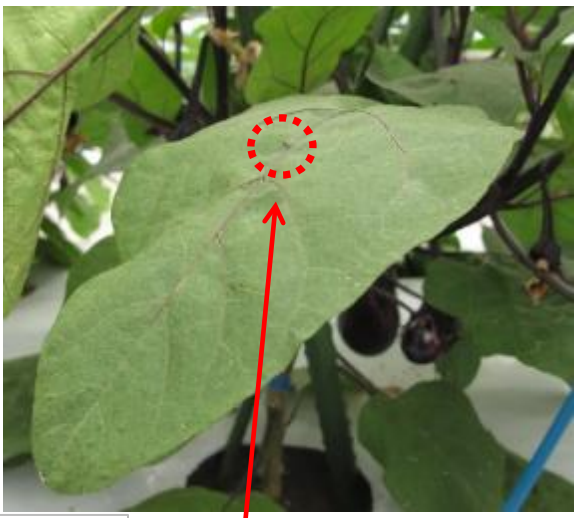
Only JP

Stage of observation:

Observations should be made after the first inflorescence starts to flower and before the start of the harvest.

Method of observation:

Even if the variety has only a few spines, assess it as “present”.



9
present

Observe carefully because some varieties have only few spines on the leaf.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
46 (+)	**VG**	**Parthenocarpy**				
QL		absent				1
G		present				9

Remarks

Only Japanese national Test

Stage of observation:

Method of observation:

Remove the style inside 3 to 5 buds of each plants and mark them three weeks after the time of beginning of flowering (as for characteristic 42). Observe the fructification condition of normally developed fruit 30 days after the removed style flower opened. Assess it as “present” if 19 of 20 test plants have normally developed fruit.

Procedure of the removing the style inside bud

1. Before removing the style

Cut the dotted line part. The pollen can pollinate on the day before flowering, therefore the style should be cut when the bud is still hard.

2. After removing the style

After confirming that the anther not dehiscent yet, remove the style by tweezers and mark them.

a. before cutting bud

b. After cutting bud

c. removing the style

d. After removing the style