nak tuinbouw

NARO 農研機構
National Agriculture and Food Research Organization

CALIBRATION MANUAL

Harmonized with Naktuinbouw and NCSS(/NARO)

DUS Test for Tulip

Tulipa L.

Established in //
Comply with UPOV TG/115/4

DUS Test for Tulip

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 characteristics included in UPOV Test Guidelines.

3. Explanations covering several characteristics

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

   (ii) Observations should be made at the time of following.
   - When the tulip is ripe. This is the stage that the pollen from the stamens begin to become loose.

4. Grouping characteristics
   4.1 Tulips can be classified as follows.

   Class I: Botanical species: botanical species with their subspecies, botanical and cultivated varieties and hybrids which resemble the botanical species. The botanical species can be further classified into the following groups:

   1. *Tulipa kaufmanniana* Regel
   2. *Tulipa fosteriana* W. Irving
   3. *Tulipa greigii* Regel
   4. Other species

   Class II: Modern hybrids

   4.2 The following have been agreed as useful grouping characteristics:

   (a) Flower: type (characteristic 10)

   (b) Flower: main color (characteristic 13) with the following groups:

Gr. 1:	white	Snowparrot
Gr. 2:	off white	
Gr. 3:	light yellow	Yellow Purissima
Gr. 4:	medium yellow	Yellow Flight
Gr. 5:	dark yellow	Lady Margot

Gr. 6: orange	Orange Monarch
Gr. 7: orange red	Temple of Beauty
Gr. 8: medium red	Lefeber's Memory
Gr. 9: dark red	Prominence
Gr. 10: purple red	Blenda
Gr. 11: light pink	Bright Pink Lady
Gr. 12: medium pink	Angélique
Gr. 13: dark pink	Pink Impression
Gr. 14: medium purple	Attila
Gr. 15: dark purple	Queen of Night
Gr. 16: brown	Cairo

4.3 In the case of modern hybrids, the following groupings have been agreed to be useful:

(a) Flower: fringe (characteristic 17)

(b) Flower: appearance of tepals (see also characteristic 20) with the following groups:

Gr. 1: convex or flat (Standard)

Gr. 2: pointed and reflexed (Lily flowered)

Gr. 3: laciniate, curled and twisted (Parrot)

Group 1:
convex or flat
(Standard)

Group 2:
pointed and reflexed
(Lily flowered)

Group 3:
laciniate, curled and twisted
(Parrot)

(c) Flower: partly greenish tepals (characteristics 21 and 22) with the following groups:

Gr. 1: absent

Gr. 2: present (Viridiflora)

absent

present (Viridiflora)

(d) Plant: beginning of flowering (natural conditions) (characteristic 31)

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

Legend

Method of Observation

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

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

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

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

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

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

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

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

Types of Expression of Characteristics

To enable the appropriate use of characteristics in DUS testing, it is important to understand the different ways in which characteristics can be expressed. The following section identifies the different types of expression and considers their application in DUS testing.

QL: Qualitative Characteristics

“Qualitative characteristics” are those that are expressed in discontinuous states (e.g. sex of plant: dioecious female (1), dioecious male (2), monoecious unisexual (3), monoecious hermaphrodite(4)). These states are self-explanatory and independently meaningful. All states are necessary to describe the full range of the characteristic, and every form of expression can be described by a single state. The order of states is not important. As a rule, the characteristics are not influenced by environment.

QN: Quantitative Characteristics

“Quantitative characteristics” are those where the expression covers the full range of variation from one extreme to the other. The expression can be recorded on a one-dimensional, continuous or discrete, linear scale. The range of expression is divided into a number of states for the purpose of description (e.g. length of stem: very short (1), short (3), medium (5), long (7), very long (9)). The division seeks to provide, as far as is practical, an even distribution across the scale. The Test Guidelines do not specify the difference needed for distinctness. The states of expression should, however, be meaningful for DUS assessment.

PQ: Pseudo-Qualitative Characteristics

In the case of “pseudo-qualitative characteristics,” the range of expression is at least partly continuous, but varies in more than one dimension (e.g. shape: ovate (1), elliptic (2), circular (3),obovate (4)) and cannot be adequately described by just defining two ends of a linear range. In a similar way to qualitative (discontinuous) characteristics - hence the term “pseudo-qualitative” - each individual state of expression needs to be identified to adequately describe the range of the characteristic.

(*) Asterisked characteristic

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.

(+) Explanations on the Table of Characteristics is indicated by TG/115/4Chapter 8.1.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
1 (*)	**MS**	**Plant: height**				
QN		very short	Lilliput, Red Hunter			1
		short	Canasta, Peach Blossom			3
		medium	Upstar		Ile de France	5
		tall	Apeldoorn			7
		very tall	Temple of Beauty			9

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Measure from the soil level to the highest point of the plant including the flower.

Note: If the leaves are higher than the flowers, the top of the leaves is the highest point of the plant.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
2 (*)	**VG**	**Stem: number of flowers**				
QL		one	Apeldoorn			1
		more than one	Georgette			2

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation. The number of the flowers per stem are counted.

Note:

1. one

2. more than one

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
3 (*)	**VG**	**Stem: anthocyanin coloration**				
QL		absent	Upstar			1
		present	Dow Jones			9

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation. . When the anthocyanin coloration is present, a remark is made about the intensity (with use of the scale: very weak to very strong) (NL)
In case of slight anthocyanin coloration on the stem, it should be assessed as present. (JP)

Note:

1. absent

9. present

9. present

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
4 (*)	**VG**	**Stem: position of anthocyanin coloration**				
QL		distal part only	Dow Jones			1
		whole stem	Halloween			2

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

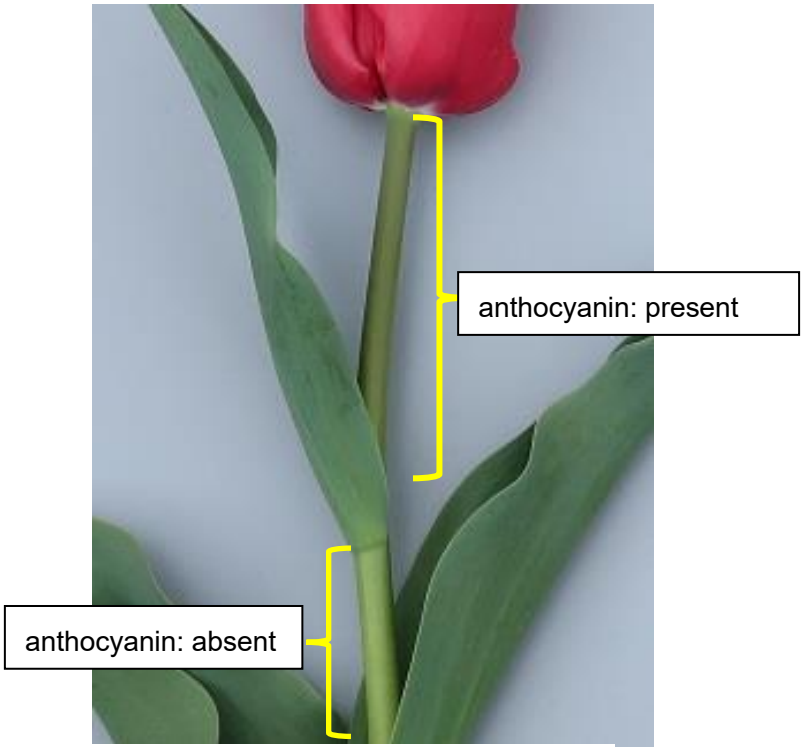
Method of observation: Visual observation.

Note:

1. distal part only

2.whole stem

4.Stem: position of anthocyanin coloration



In this case, it is “distal part only”.

No note is available.

(remark: at basal part)

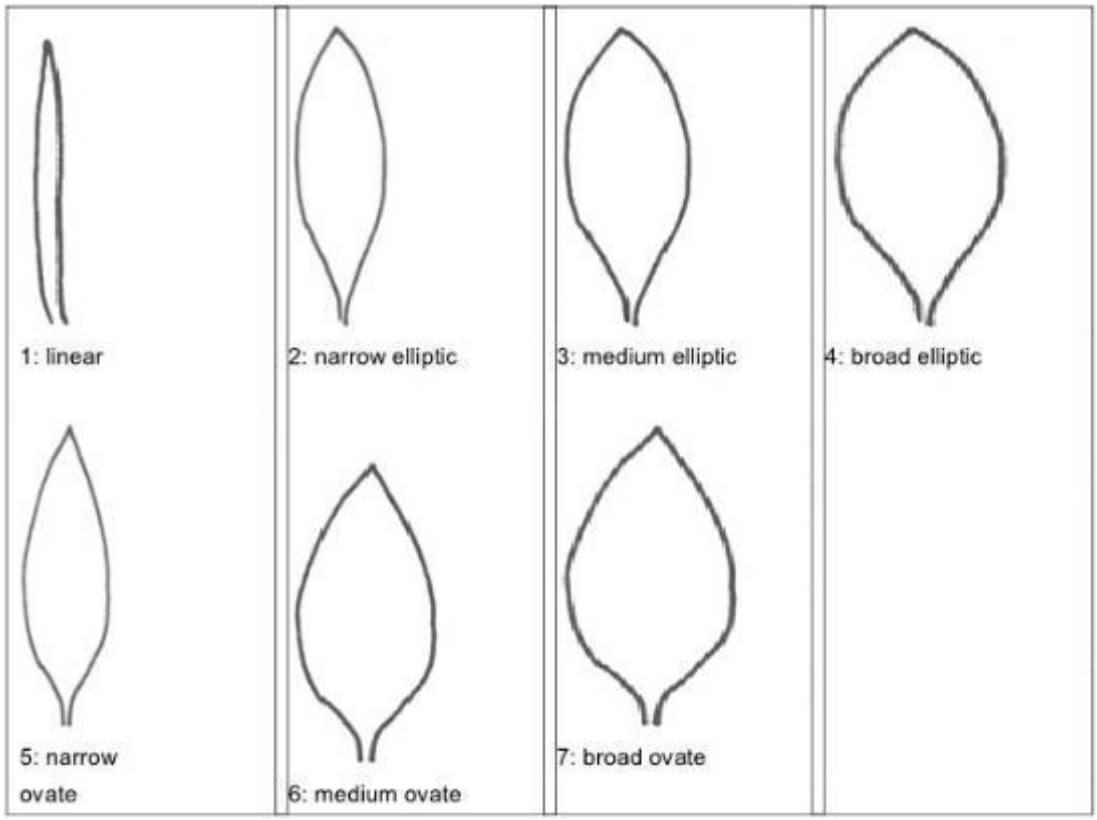
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
5 (*)	**VG**	**Leaf: shape**				
PQ		linear	Lilliput			1
		narrow elliptic				2
		medium elliptic	Blushing Beauty			3
		broad elliptic	Apeldoorn			4
		narrow ovate				5
		medium ovate	Havran			6
		broad ovate	Grand Prestige			7

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation. Take off basal leaf from the stem and spread the leaf on a smooth surface.

Note:



5. leaf shape

1. linear

2. narrow elliptic

3. medium elliptic

4. broad elliptic

5. narrow ovate

6. medium ovate

7. broad ovate

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
6 (*)	**VG**	**Leaf: variegation**				
QL		absent	Apeldoorn		Pink Impression	1
		present	Unicum		Unicum	9

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation on the upper side of the leaves.

Note:

1. absent

9. present

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
7 (*)	**VG**	**Leaf: distribution of variegation**				
PQ		on margin	Happy Generation,			1
		marginal zone				2
		dots	Grand Prestige			3
		dots and stripe	Ali Baba, Calypso			4
		stripes	Toulon			5

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note: If more than one note is applicable, add the second note as a remark in the description. (NL)

If more than one note is applicable, indicate them together. (JP)

NL: we would like to remove 'Flash Point', 'Diplomate' and 'Madame Lefeber' (also for char. 8) as example varieties. We would describe the example variety 'Flash Point' (note 2) as 'on margin' and NOT 'marginal zone'. The example variety 'Diplomate' and 'Madame Lefeber' (note 1) is known to us as a variety without leaf variegation.

Leaf: distribution of variegation

1. on margin

2. marginal zone

3. dots

4. dots and stripes

5. stripes

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
8 (*)	**VG**	**Leaf: color of variegation**				
PQ		white	- Unicum			1
		yellow green	Darwidesign			2
		yellow	Ton Augustinus			3
		pink				4
		red				5
		purple	First Love, Copenhagen			6

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note:

8. Leaf: color of variegation

1. white

No picture available

2. yellow green

3. yellow

4. pink

No picture available

5. red

6. purple

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
9 (*)	**VG**	**Leaf: undulation of margin**				
QL		absent	Apeldoorn			1
		present	Christmas Marvel			9

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note: When the undulation of the margin is present, add a remark about the degree of the undulation (with use of the scale: very weak to very strong). (NL)

9: present, degree is weak

9: present, degree is medium

9: present, degree is strong

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
10 (*)	**VG**	**Flower: type**				
(+)		single	Apeldoorn		Pink Impression	1
QL		double	Monte Carlo		Monte Carlo	2

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

UPOV explanation: Double varieties are varieties with 12 or more tepals.

Note:

1. single

2. double

2: double (flower), This flower has slightly more than 12 tepals, so it is double.

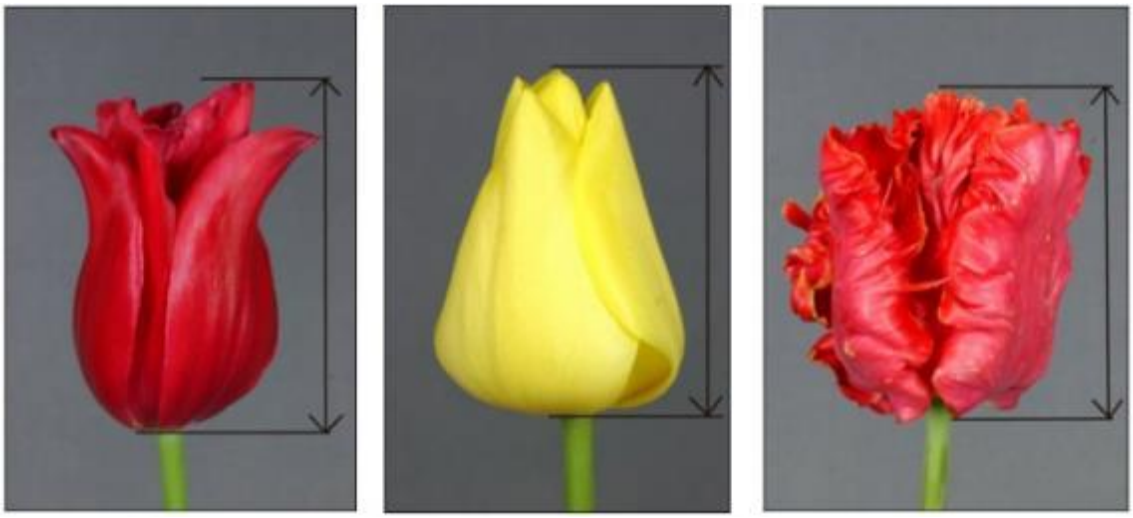
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
11 (*)	**MS**	**Flower: length**				
QN		very short	Lilliput			
		short	Monte Carlo			
		medium	Pink Impression		Pink Impression	
		long	Gander			
		very long	Tender Beauty			

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Measurement or visual observation on closed flowers. By the use of measurement: the length of the closed flowers is measured (in millimeters).

Note:



The arrows indicate where the length of the flower should be measured.

These flowers are too open for observation. (JP)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
12 (*) (+)	**VG**	**Only single flower type varieties: Flower: shape**				
PQ		ellipsoid	Prinses Irene			1
		ovoid	Apeldoorn, Purple States			2
		lily flower	Aladdin			3

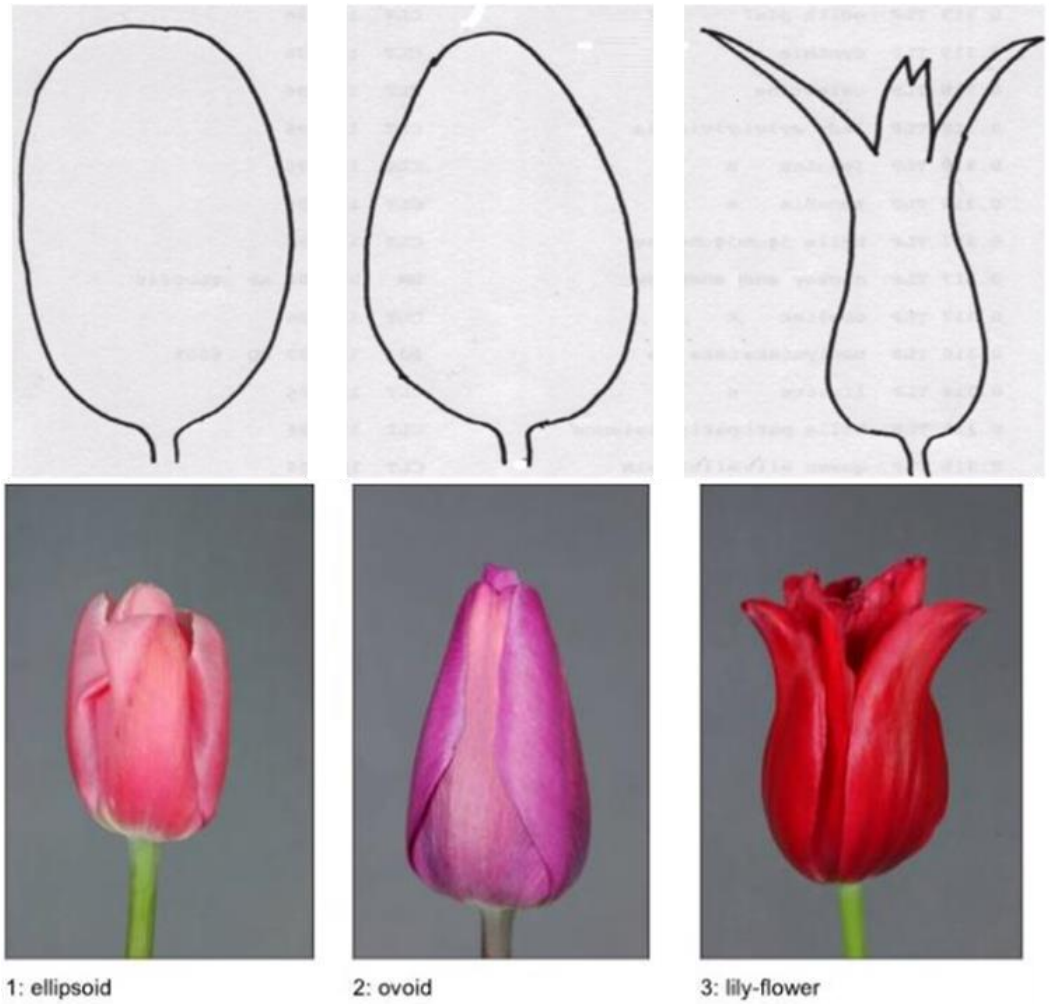
Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation on closed flowers.

Note:

UPOV explanation:



1: ellipsoid 2: ovoid 3: lily-flower

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
13 (*)	**VG**	**Flower: main color**				
PQ		RHS Colour Chart (indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.

The main color is the color with the largest surface area. In cases where the areas of the main and secondary color are too similar to reliably decide which color has the largest area, the darker color is considered to be the main color.

Observe the color that occupies the largest area of surface of the flower. (include inner and outer tepals) (JP)

Note:

13. Flower: main color


white


light yellow


yellow


orange


orange


red


dark purple red


pink


dark pink


purple


purple


dark purple

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
14 (*)	**VG**	**Flower: number of colors on outer side**				
QL		one	Apeldoorn			1
		two	Early Surprise			2
		three or more	Tricolette			3

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note: As it is showed in photo left, lower row, sometimes it happens that the outer tepals have irregular green parts, this green color is not scored as a second color. It is most likely an interim phase between leaf and flower and probably due to the big size of the bulb or the higher temperature. On the photo right, lower row, the green color is scored as a second color as it is a variegation resulted from the genetic background. (NL)

14 Flower: number of colors on outer side

1. one

2. two

2. two

The yellow color at the base can be seen in side view, so it is included in the number of colors.

1. one

The green sections on the outer tepals are not considered to be a secondary color. See explanation at ‘note’

2. two

2.two

variegated

The color is characterized by the green color on the tepals.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
15 (*) PQ	**VG**	**Only varieties with more than one color on outer side:** **Flower: distribution of secondary color on outer side**				
		on margin	Yellow Pompenette			1
		marginal zone	Lustige Witwe			2
		flamed	Prinses Irene			3
		flushed	Peach Blossom			4
		at base	Gudoshnik			5

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note: The photos show a number of possible positions of the secondary color. It is also possible that the secondary color lies on the marginal zone (or across the border) and is flamed, as shown in the photo under left.

15. Flower: distribution of secondary color on outer side

1: on margin

2: marginal zone

3: flamed

No picture available

4. flushed

5. at base

marginal zone(2) and flamed(3)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
16	**VG**	**<u>Only varieties with more than one color on outer side:</u>**				
PQ		**Flower: secondary color on outer side**				
		RHS Colour Chart				
		(indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.

Note:

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
17 (*)	**VG**	**Flower: fringe**				
QL		absent	Apeldoorn			1
		present	Barbados, Fancy Frills			9

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note:

1. absent

1. absent (this is not a fringed flower, but a ‘Parrot’ (laciniate, curled and twisted)

9. present

17. Flower: fringe

In this case, “absent”, add remark ‘incised’(NL)

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
18 (*)	**VG**	**Flower: conspicuousness of fringe**				
QN		weak	Arma			1
		intermediate	Crystal Beauty			2
		strong	Barbados, Valery Gergiev			3

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note:

1. weak

2. intermediate

3. strong

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
19 (*)	**VG**	**Flower: position of fringe on tepals**				
PQ		top only	Calibra			1
		all over margin	Capri, Hamilton			2
		irregular				3

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Note:

top only: fringe only present at upper third of tepal.

all over margin: fringe present at more than only upper third of tepal.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
20 (*)	**VG**	**Flower: shape of tip of outer tepal**				
PQ		acuminate	Aladdin			1
		acute	Temple of Beauty			2
		rounded	Caravelle			3
		emarginate	Jan van Nes			4

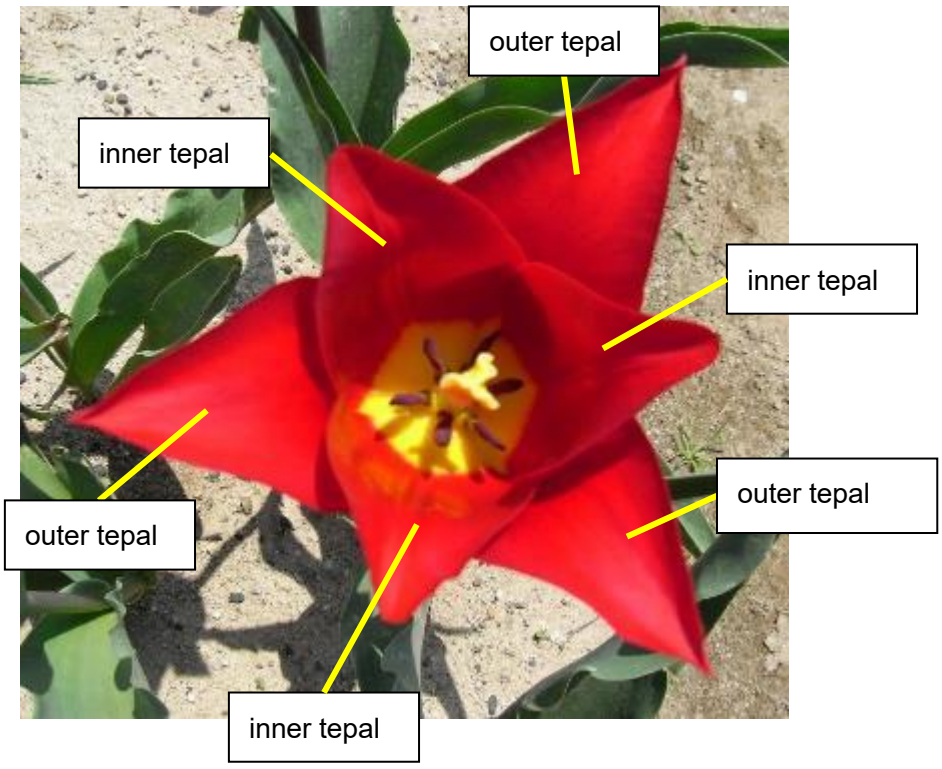
Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

Observe with the tepals spread. (JP)

Note: This photo shows outer tepals and inner tepals



20. Flower: shape of tip of outer tepal

1: acuminate

2: acute

3: rounded

4: emarginate

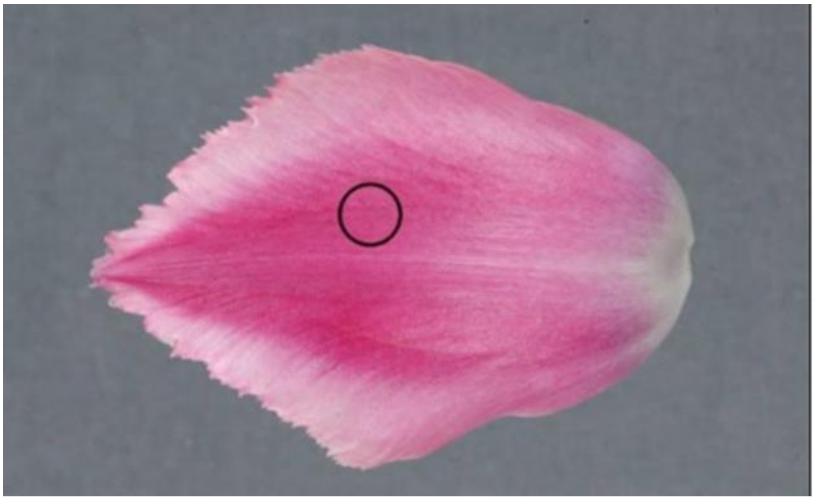
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
21 (*) **PQ**	**VG**	**Flower: main color of <u>central part</u> of outer side of <u>inner tepal</u>** RHS Colour Chart (indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.–

Note:



Position were the main color on the outer side of the inner tepal is determined, using the RHS Colour Chart.

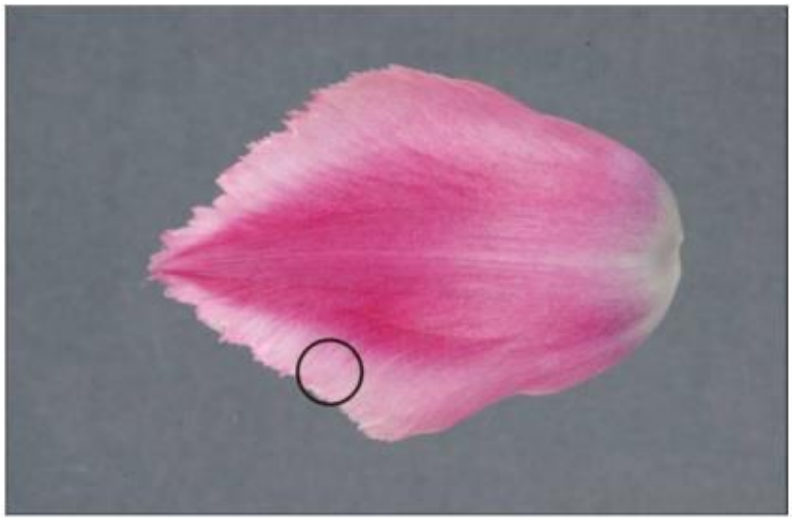
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
22 (*)	**VG**	**Flower: main color of <u>marginal part</u> of outer side of <u>inner tepal</u>**				
PQ		RHS Colour Chart (indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.

Note:



Location were the main color of the marginal part of the outer side of the inner tepal is determined, using the RHS Colour Chart.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
23 (*)	**VG**	**Flower: main color of <u>central part</u> of inner side of <u>inner tepal</u>**				
PQ		RHS Colour Chart (indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.–

Note:

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
24 (*)	**VG**	**Flower: main color of <u>marginal part</u> of inner side of <u>inner tepal</u>**				
PQ		RHS Colour Chart (indicate reference number)				

Remarks

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.

Note:

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
25 (*)	**VG**	**Flower: main color of macule on inner side**				
(+)		RHS Colour Chart				
PQ		(indicate reference number)				

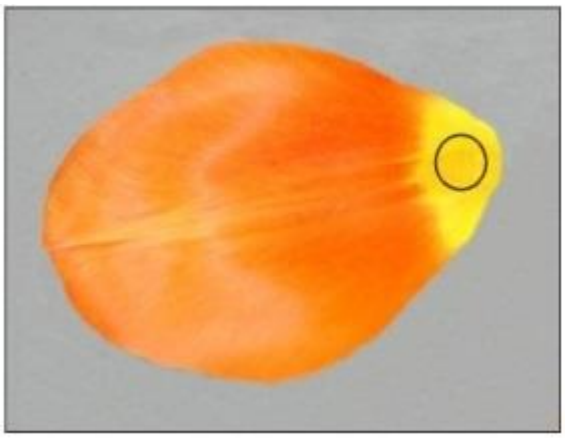
Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation with use of the RHS colour chart.

If the macule is the same as the color of the petals, record the color of basal zone on inner side of the tepal. (JP)

UPOV explanation: The macule should be observed as an entity and the tepals should not be spread.

25. Flower: main color of macule on inner side



Location were main colour of the macule on the inside of the inner tepals is determined, using the RHS colour chart.

In this picture the macule is yellow.

↑

In this picture the macule is black.

Record the color of basal zone on inner side of the tepal. (yellow)

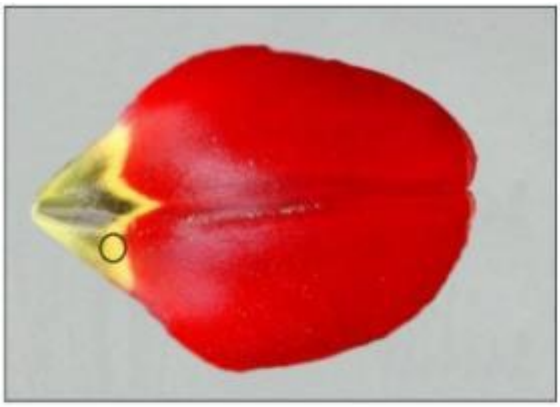
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
26 (*)	**VG**	**Flower: different color of border of macule**				
QL		absent	Blushing Apeldoorn			1
		present	Apeldoorn			9

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation. If the different color of border of macule is present, a remark is added which color this is. (NL)

Photo: The circled area in the photo above left, shows the exact location on the border on the inner side of the inner tepals. If the border of the macule shows a different color in the form of a hue, as shown in the photo under left, it is sufficient to indicate the main color. Accurate color determination by the RHS Colour Chart is not necessary. It is also possible that the border of the macules absent, as in the photo under right. In such case, the color of the border of the macule is absent.

26. Flower: different color of border of macule



9: present
A different colour on the border of the macule is shown as in the photo.

9: present
A different colour on the border of the macule is present.

9: present
Different colour on the border of the macule on the inside of the inner tepals is present.
In this case as a hue.

1: absent
A different colour on the border of the macule on the inner tepals is absent.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
27 (*)	**VG**	**Stamen: number of colors of filament**				
QL		one				1
		two				2

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

1. one

1. one

Basal part is light yellow, distal part medium yellow, as the color for both parts is 'yellow' the number of colors of the filament is described as one.

2. two

Base is white, distal part blue purple.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
28	**VG**	**Stamen: color of basal half of filament**				
PQ		white				1
		light yellow				2
		medium yellow				3
		dark yellow				4
		purple				5
		blue				6
		black				7

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

1: white

2: light yellow

1: white

28. Stamen: color of basal half of filament

			
4: dark yellow	**5: purple, with remark: base white**	**6: blue, with a remark: base white**	**7: black, with a remark: base yellow**

If the stamen has a secondary color,

JP: Remark the secondary color such as “purple (base: white)”

NL: As this characteristic describes the color of the basal half, the color should be assessed as purple, with a remark: at the base white. The color with the largest surface area is purple.

If there is another color, remark it.

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
29	**VG**	**Stamen: color of <u>distal half</u> of filament**				
PQ		white				1
		light yellow				2
		medium yellow				3
		dark yellow				4
		purple				5
		blue				6
		black				7

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation.

1: white

3: medium yellow

5: purple

(remark: the tip is white)

			
4: dark yellow	**5: purple**	**6: blue**	**7: black**

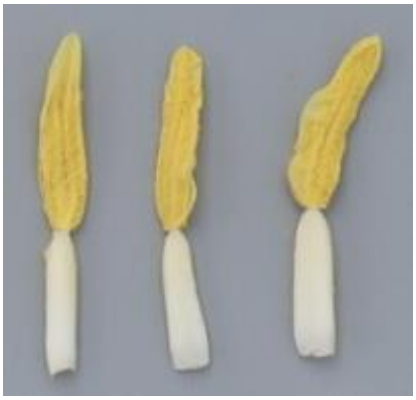
		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
30 (*)	**VG**	**Stamen: color of pollen**				
PQ		greenish	Easter Moon			1
		yellow	Gander Special			2
		yellow and purple or black				3
		purple or black	Christmas Orange			4

Stage of observation: See Chapter 3, paragraph (ii).

Method of observation: Visual observation. . It is easier to see the pollen on a white background and then tapping the pollen to observe the color.

Photo: The photos show different colors of the pollen.

1. greenish



2. yellow

3. yellow and purple or black

4. purple or black

		English	UPOV Example Varieties	Netherlands Example Varieties	Japan Example Varieties	Note
31 (*)	**VG**	**Plant: beginning of flowering (natural conditions)**				
QN		very early	Love Song, Showwinner, Early Harvest			1
		early	Bestseller, Apricot Beauty, Flair			3
		medium	Apeldoorn, Prinses Irene			5
		late	Temple of Beauty, Renown, Queen of Night			7
		very late	Dillenburg, Princess Margaret Rose			9

Stage of observation: See Chapter 3, paragraph (ii).

When 10% of the flowers in the plot area have bloomed and pollen has been confirmed. (JP)

Method of observation: Visual observation.

Record the date when 10% of flowers bloom. (JP)