



TGP/14.2.3.1 Draft 1

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

Associated Document
to the
General Introduction to the Examination
of Distinctness, Uniformity and Stability and the
Development of Harmonized Descriptions of New Varieties of Plants (document TG/1/3)

DOCUMENT TGP/14

**“GLOSSARY OF TECHNICAL, BOTANICAL AND STATISTICAL TERMS
USED IN UPOV DOCUMENTS”**

**Section TGP/14.2.3.1: Botanical Terms:
Color: Color Characteristics**

*Document prepared by an expert from
the Community Plant Variety Office (CPVO)*

to be considered by the

*Technical Working Party for Fruit Crops
at its thirty-sixth session,
to be held in Kôfu, Japan, from September 5 to 9, 2005*

and the
*Technical Working Party for Ornamental Plants and Forest Trees
at its thirty-eighth session,
to be held in Seoul, Republic of Korea, from September 12 to 16, 2005*

COLOR CHARACTERISTICS

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SECTION 1: INTRODUCTION

1.1 Guidance to the description of colors and color patterns

The purpose of this document is to provide guidance on the description of colors and color patterns. Examples how this can be described were collected from adopted Test Guidelines.

1.2 Elements of color

A color is complex and can be defined in terms of 3 main elements:

1.2.1 HUE: the hue distinguishes the kind of color: is it red or blue or green [or yellow or violet, etc.].

1.2.2 BRIGHTNESS: distinguishes the total amount of light that is reflected by the color, how the color is perceived by the eye on the light to dark scale. [The term “intensity” is usually used in the UPOV Test Guidelines for “saturation”]

1.2.3 SATURATION: saturation [or intensity] is the element that the purity or grayness of the color. Spectral colors are fully saturated, [or at the maximal intensity] that the normal eye can appreciate. Any mixture with another color or with white or grey reduces the saturation [or intensity]. [In UPOV Test Guidelines, the saturation is often referred to as “glaucoesity” or “grey hue”].

Annex B provides a copy of the introduction to the RHS Colour Charts, which defines colors according to these three attributes.

1.3 Description of colors

1.3.1 When describing a color it is appropriate to use:

(a) Basic color names: yellow, red, green, blue etc. or

(b) A combination of 2 basic colors, where the second color indicates the main color. For example greenish red is belonging to the red colors and reddish green belongs to the green group.

(c) To add dark and light to the basic color name or the combination of 2 basic color to describe the colors

Example: dark red
light yellow green

1.3.2 It is necessary to use more or less characteristics, depending on the quantity of possible colors that appear in the crop and organ to describe. For example:

One or two characteristics for the hue (as defined in 1.2.1)

If the number of hues is less than ten, a single characteristic will usually be sufficient in the Test Guidelines. The expression of the color may use only one word (e.g. yellow) or two words in continuation (e.g. greenish yellow).

1.4 Not recommended color names

Other color descriptions than mentioned in 1.3, like fuchsia, salmon, bronze etc. should not be used without care since these color names could cause confusion concerning the intended color.

1.5 Use of a Color Chart

For color observations a color chart may be used as a reference. Because of its worldwide availability UPOV uses the color chart from the Royal Horticultural Society (RHS), the “RHS Colour Chart”.

Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should be conform to the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, part I. These determinations should be made with the plant part placed against a white background.

When using the RHS Colour Chart, not only the reference number should be mentioned in the variety description, it should also contain the color name. Therefore a proposal for naming the colors has been made in TGP/14.2.3.1.

1.6 Moment of color observations

All color observations on the different organs of the plant should be made at a clearly defined state of development of the organ. Color expression of the organ might change during aging of the plant.

1.7 Order of color expression

In color characteristics the expression of colors is normally presented in the following order: white-green-yellow-orange-pink-red-blue-purple-violet-brown. However, the chronological appearance of the color (e.g. as the fruit ripens) may also be used (see also documents TGP/14.2, Glossary of Botanical, Statistical and Terms Used in UPOV Documents: Botanical Terms) where appropriate. The same sequence should normally be used for organs with similar states within the same Test Guidelines (e.g. color of leaf and color of the stem).

SECTION 2: DEFINITIONS IN RELATION TO COLOR

2.1 General definitions

2.1.1 MAIN COLOR: color of the largest area for the (part of the organ) observed

2.1.2 SECONDARY COLOR: when more than one color is present, the second largest area is called the secondary color.

2.1.3 BASIC COLOR: the obvious color of an organ. For example, a variegated leaf. It is obvious that the basic color is green. It is not always necessarily the largest area of the (part of the) organ concerned.

2.1.4 GROUND COLOR: For example, when a flower has a white color and other colors are present in the form of spots, a macule, or a color flush, the white color is considered as the ground color. It is not always necessarily the largest area of the (part of the) organ concerned.

2.1.5 OVER COLOR: In the case of an organ which has a ground color with a second color present in the form of a blush, which is not very sharply bordered, this blush is called the over color. It is not always necessarily the smallest area of the (part of the) organ concerned.

2.1.6 ANTHOCYANIN COLORATION: flush, part of the organ or whole organ has an over color of anthocyanin. Usually the area where it is present, the color and the intensity of the anthocyanin coloration is described.

Examples from TG/77/9 Gerbera

Characteristic 19: Flower head: anthocyanin coloration at distal part of inner bracts

States of expression: absent – present

Characteristics 20: Flower head: intensity of anthocyanin coloration at distal part of inner bracts

States of expression: weak – medium - strong

2.2 Definitions in relation to the description of color patterns (see also TGP/14.2.1)

2.2.1 FLUSH = hue of another color as a thin, transparent layer over the ground color of a surface

2.2.2 BLUSH = hue of another color as a non transparent layer over the ground color of the surface

2.2.3 VARIEGATION = exhibiting different colors, especially as irregular patches or stripes

2.2.4 PATCHES = irregular spot, (small) irregular area of the surface that has another color.

2.2.4 VENATION = different color of veins compared to the rest of the organ

- 2.2.5 EDGED = different color around the edge of an organ
- 2.2.6 SPECKLED = with small spots or patches
- 2.2.7 SHADED = with a darker shade of the same hue
- 2.2.8 STRIPED = with spots in the form of stripes
- 2.2.9 NETTED = with the color pattern of the secondary color as a net over the surface of the organ.
- 2.2.10 SPOTTED = with the color pattern of the secondary color as (small) spots
- 2.2.11 PICOTEE = special color pattern of edge on a flower, where the edge is of a different, contrasting, color. This type of color pattern is often found in Dianthus, but can also be found in other species like Helleborus and Hemerocallis.
- 2.2.12 STRIATED = with linear markings
- 2.2.13 MOTTLED = marking with spots or smears of color

SECTION 3: COLOR CHARACTERISTICS OF THE MOST IMPORTANT PLANT ORGANS:

3.1 Introduction

In order to give guidance in the description of colors of the plant some specific elements for the main organs like leaf, flower/inflorescence and fruits are given in different paragraphs. The full presentation of the mentioned examples is given in Annex 1 of this document.

3.2 Color characteristics of the leaf

3.2.1 Usual description of the leaf color

Example of the description of the color of the leaf, when the color of the leaf is only green. Usually described as ‘Leaf: intensity of green color:

Example: TG/216/1 Hypericum

Characteristic 8: Leaf: intensity of green color

States of expression: light – medium - dark

3.2.2 Other description of the leaf color

Sometimes described as ‘Leaf: color’, especially when other colors than green are present in the species:

Example: TG/222/1 Argyranthemum

Characteristic 8: Leaf: color of upper side

States of expression: light green – medium green – dark green – blue green – grey green

3.2.3 Description of variegated leaf color

When the leaf color is variegated the color is often difficult to describe. The variegated part is often very irregular and might be different in young and mature leaves. Therefore the variegation pattern is sub divided in different elements.

Example: TG/171/3 Ficus benjamina

Characteristic 21: Leaf blade: number of colors

States of expression: one – two – three or more

Characteristic 24: Leaf blade: border between colors

States of expression: not clearly defined – clearly defined

Characteristic 25: Leaf blade: regularity of color patches

States of expression: irregular – regular

Characteristic 26: Leaf blade: ground color of young leaf

States of expression: yellowish white – light yellowish white – light green - medium green – greyish green – dark green – very dark green

Characteristic 27: Leaf blade: ground color of mature leaf

States of expression: yellowish white – light yellowish white – light green - medium green – greyish green – dark green – very dark green

Characteristic 28: Leaf blade: secondary color

States of expression: yellowish white – light yellowish green – light green – medium green – greyish green – dark green – very dark green

Characteristic 29: Leaf blade: distribution of secondary color

States of expression: near main vein – near margin – randomly spread

Characteristic 30: Leaf blade: tertiary color

States of expression: yellowish white – light yellowish green – light green – medium green – greyish green – dark green – very dark green

Characteristic 31: Leaf blade: area of ground color compared to area of other colors

States of expression: very small- small – medium – large –very large

Characteristic 32: Leaf blade: color of main vein

States of expression: yellowish white – yellowish – light green – medium green - dark green

Characteristic 33: Leaf blade: degree of color contrast of venation

States of expression: weak – medium - strong

3.3 Color characteristics of the flower

3.3.1 Observation of the main color

The main color of a flower or an inflorescence is often scored by noting down the general color impression of the whole flower or of the whole inflorescence. This main flower color/inflorescence color is often used as a grouping characteristic.

3.3.2 Observations in the case of more colors present

When the flower or organ of the flower has more than one flower color, the number of flower colors is usually observed and the colors recorded separately.

3.3.3 Distribution of color can be important, especially in the case of single colored varieties where the intensity of the color might vary within one organ.

Example: Gerbera TG/77/9

Characteristic 33: Single colored varieties only: Outer ray floret only: distribution of color
States of expression: none – lighter towards base – lighter towards top

3.3.4 Color description of a petal

Colors are usually separately described for the different flower organs. For petals usually both upper/inner and lower/outer side are described separately. When colors are not evenly distributed the place on the petal where the color should be observed should be specified.

Example: Clematis TG/251/1

Characteristic 41: Varieties with one color only: Sepal: color distribution of upper side
States of expression: lighter towards middle – even – lighter towards margins

Characteristic 43: Varieties with more than one color only: Sepal: color distribution of upper side
States of expression: edged – central bar – speckled – along veins

3.3.5 Color and age

Colors of the flower or flower organs might change with age of the flower and have to be observed in several stages.

Example: TG/94/6 Calluna

Characteristic 18: Varieties with opening buds only: Flower: color of outer side of petal at beginning of flowering
States of expression: RHS Colour Chart (indicate reference number)

Characteristic 19: Varieties with opening buds only: Flower: color of outer side of petal at end of flowering
States of expression: RHS Colour Chart (indicate reference number)

Example: TG/86/5 Anthurium

Characteristics 37: Spadix: Main color of distal part shortly before dehiscence of anthers
States of expression: white – yellow – orange – red – red purple – purple – green – brown

Characteristics 39: Spadix: Main color of distal part shortly after dehiscence of anthers
States of expression: white to cream – yellow – orange – pink – red – red purple – purple

3.3.6 Color patterns

The color patterns of a flower can be many and complex, some examples can be found in the following paragraphs.

3.3.6.1 Stripes: can be equally divided over the flower surface, or on different organs of the flower or on parts of these organs.

Example TG/29/6 Alstroemeria

Characteristic 17: Outer tepal: stripes on inner side of blade
States of expression: absent - present

Characteristic 18: Outer tepal: number of stripes on inner side of blade
States of expression: few – medium - many

Characteristic 21: Inner lateral tepal: number of stripes on inner side of blade
States of expression: few – medium - many

Characteristic 22: Inner lateral tepal: size of stripes on inner side of blade
States of expression: small – medium - large

3.3.6.2 Crops with a very large variation of color patterns such as Phalaenopsis.

Example: TG/213/1 Phalaenopsis

Characteristic 34: Lateral sepal: color pattern
States of expression: evenly colored – shaded – edged – striped – netted – spotted – shaded and striped – shaded and netted – shaded and spotted – edged and striped and spotted

Example: TG/25/8 Dianthus

Characteristic 48: Petal: color distribution of blade (claw excluded)
States of expression: picotee – edged – striated – speckled – picotee striated – picotee speckled – edged striated – edged speckled – picotee striated speckled – striated speckled – shading off - flushed

3.3.6.3 Veining: different color around the veins of the flower.

Example: TG/212/1 Petunia

Characteristic 27: Corolla lobe: conspicuousness of veins on upper side
State of expression: absent or very weak – weak – medium – strong – very strong

3.3.6.4 Shading

Example: TG/209/1 Dendrobium

Characteristic 64: Varieties with shaded petals only: Petal: color of shading
States of expression: RHS Colour Chart (indicate reference number)

3.3.7 The Eye of a flower

Eye: usually round part on petals around the reproductive organs; can have more than one color.

Example: TG/214/1 Catharanthus

Characteristic 16: Flower: eye zone
States of expression: absent - present

Characteristic 17: Flower: size of eye zone relative to flower size
States of expression: small – medium - large

Characteristic 18: Flower: number of colors of eye zone
States of expression: one – two – more than two

Characteristic 19: Varieties with one color of eye zone only: Flower: border of eye zone
States of expression: sharp - diffuse

Characteristic 20: Flower: color of inner eye zone
States of expression: RHS Colour Chart (indicate reference number)

Characteristic 21: Varieties with more than one eye zone color only: Flower: color of outer eye zone
States of expression: RHS Colour Chart (indicate reference number)

3.3.8 Macule: blotch on flower part.

Example: TG/108/3 Gladiolus (for characteristic 34: the shape of the macule is explained in a drawing annexed to the guideline).

Characteristic 32: Median outer segment of perianth: presence of macule
States of expression: absent - present

Characteristic 33: Median outer segment of perianth: size of macule compared to that of segment

States of expression: very small – small – medium – large – very large

Characteristic 34: Median outer segment of perianth: shape of the macule
States of expression: type 1 – type 2 – type 3 – type 4 – type 5

Characteristic 35: Median outer segment of perianth: color of the macule
States of expression: RHS Colour Chart (indicate reference number)

3.4 Color characteristics of the fruit

3.4.1 Observation of fruits/berries in the ornamental sector

3.4.1.1 Although fruits are, in general, not observed in the ornamental sector, there are some species, like *Hypericum*, where berries are harvested for ornamental purposes.

Example: TG/126/1 *Hypericum*

Characteristic 35: Berry: main color
States of expression: RHS Colour Chart (indicate reference number)

3.4.1.2 With breeding advances, such as in *Hypericum*, more and more color groups have to be added in time to cover all colors. The Test Guidelines and Technical Questionnaires need to be updated regularly.

Example: TG/126/1 *Hypericum*

Characteristic 34: Berry: color group
States of expression: white – cream – green – brownish green – yellow – orange – light pink – pink – dark pink – red pink – orange red – light red – red – dark red – red purple – red brown – purple brown – brown – grey brown

3.4.2 Observations of fruits in the fruit sector (to be further elaborated by the TWF)

3.4.2.1 Ground color of the fruit

Fruit like apples often have a ground color with an over blush. This is recorded separately.

Example: TG/14/9 *Malus*

Characteristic 35: Fruit: ground color
States of expression: not visible – whitish yellow – yellow – whitish green – yellow green - green

3.4.2.2 Over color of the fruit

In apple, this over color, its intensity and pattern are recorded separately.

Example: TG/14/9: Malus

Characteristic 37: Fruit: hue of over color with bloom removed
States of expression: orange red – pink red – red - purple red – brown red

Characteristic 38: Fruit: intensity of over color
States of expression: light – medium – dark

Characteristic 39: Fruit/ pattern of over color
States of expression: only solid flush – solid flush with weakly defined stripes – solid flush with strongly defined stripes – weakly defined flush with strongly defined stripes – only stripes (no flush) – flushed and mottled – flushed, striped and mottled

SECTION 4: LITERATURE

RHS Colour Chart, 2001, Royal Horticultural Society, London, UK

International Commission on Illumination C.I.E./USA: ISO 15469:2004/CIE S 011/E:2003,
Spatial distribution of daylight – CIE standard general sky

SECTION 5: RELATED UPOV DOCUMENTS

TG/1/3: General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants

TGP/7, Annex 4: Collection of Approved Characteristics

TGP/14: Glossary of Technical, Botanical and Statistical Terms Used in UPOV Documents.

TGP/14.2.3.2: Color: Color groups

UPOV Technical Guidelines:

TG/14/9	Apple
TG/25/8	Dianthus
TG/29/6	Alstroemeria
TG/77/9	Gerbera
TG/86/5	Anthurium
TG/94/6	Calluna vulgaris
TG/108/3	Gladiolus
TG/171/3	Ficus benjamina
TG/209/1	Dendrobium
TG/212/1	Petunia
TG/213/1	Phalaenopsis
TG/214/1	Catharanthus
TG/216/1	Hypericum
TG/222/1	Argyranthemum
TG/251/1	Clematis

[Annex A follows]

ANNEX A: EXAMPLE CHARACTERISTICS

2.1.6 Anthocyanin coloration

Example from TG/77/9 Gerbera

19. (*)	Flower head: anthocyanin coloration at distal part of <u>inner</u> bracts	Capitule: pigmentation anthocyanique au niveau de la partie distale des bractées <u>internes</u>	Blütenstand: Anthocyanfärbung am oberen Teil der <u>inneren</u> Hüllblätter	Capítulo: pigmentación antociánica en la parte distal de las brácteas <u>interiores</u>		
	absent	absente	fehlend	ausente	Baby-Doll, Ferrari	1
	present	présente	vorhanden	presente	Ashley, Nevada	9

Example from TG/77/9 Gerbera

20.	Flower head: intensity of anthocyanin coloration at distal part of <u>inner</u> bracts	Capitule: intensité de la pigmentation anthocyanique au niveau de la partie distale des bractées <u>internes</u>	Blütenstand: Intensität der Anthocyanfärbung am oberen Teil der <u>inneren</u> Hüllblätter	Capítulo: intensidad de la pigmentación antociánica en la parte distal de las brácteas <u>interiores</u>		
	weak	faible	gering	débil	Moana, Planpret	3
	medium	moyenne	mittel	media	Lucifer, Zsa-Zsa	5
	strong	forte	stark	fuerte	Terthermo	7

3.2.1 Usual description of the leaf color

Example: TG/216/1 Hypericum

8. (*)	Leaf: intensity of green color	Feuille: intensité de la couleur verte	Blatt: Intensität der Grünfärbung	Hoja: intensidad del color verde		
QN	light	claire	hell	claro	Pamala	3
	medium	moyenne	mittel	medio	Red Condor	5
	dark	foncée	dunkel	oscuro	Bosaenv	7

3.2.2 Other description of the leaf color

Example: TG/222/1 Argyranthemum

7. (*)	VG	Leaf: color of upper side	Feuille: couleur de la face supérieure	Blatt: Farbe der Oberseite	Hoja: color del haz		
PQ		light green	vert clair	hellgrün	verde claro	Supaellie	1
		medium green	vert moyen	mittelgrün	verde medio	Summer Melody	2
		dark green	vert foncé	dunkelgrün	verde oscuro		3
		blue green	bleu vert	blaugrün	verde azulado	Supacher	4
		grey green	gris vert	graugrün	verde grisáceo	Argyraketis	5

3.2.3 Description of variegated leaf color

Example TG/171/3 Ficus benjamina

21. (*)	Leaf blade: number of colors	Limbe: nombre de couleurs	Blattspreite: Anzahl Farben	Limbo: número de colores		
	one	une	eine	uno	Esther, Exotica	1
	two	deux	zwei	dos	Reginald, Vivian	2
	three or more	trois ou plus	drei oder mehr	tres o más	Francis, Starlight	3

Example TG/171/3 Ficus benjamina

24.	<u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: border between colors	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: limite entre les couleurs	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Abgrenzung der Farben	<u>Variedades bi- o multicolor solamente:</u> Limbo: limite entre los colores		
	not clearly defined	pas clairement définie	nicht deutlich	no definida claramente	Exotic Monique, Starlight	1
	clearly defined	clairement définie	deutlich	definida claramente	Deborah, Profit	2

Example TG/171/3 Ficus benjamina

25.	<u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: regularity of color patches	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: distribution des taches de couleur	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Regelmäßigkeit der Muster	<u>Variedades bi- o multicolor solamente:</u> Limbo: distribución de las manchas de color		
	irregular	irrégulière	unregelmäßig	irregular	De Gantel, Reginald	1
	regular	régulière	regelmäßig	regular	Fiwama, Nikita	2

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
26. <u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: ground color of <u>young leaf</u>	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: couleur de fond de la <u>jeune</u> feuille	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Grundfarbe des <u>jungen</u> Blattes	<u>Variedades bi- o multicolor solamente:</u> Limbo: color principal de la hoja joven		
yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Curly, Samantha	1
light yellowish green	vert jaunâtre clair	hell gelblichgrün	verde amarillento claro	Monique, Reginald	2
light green	vert clair	hellgrün	verde claro	Golden King, Marole	3
medium green	vert moyen	mittelgrün	verde medio	Exotic Monique	4
greyish green	vert grisâtre	gräulichgrün	verde grisáceo	Jennifer	5
dark green	vert foncé	dunkelgrün	verde oscuro		6
very dark green	vert très foncé	sehr dunkelgrün	verde muy oscuro		7

Example TG/171/3 Ficus benjamina

26. <u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: ground color of <u>young leaf</u>	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: couleur de fond de la <u>jeune</u> feuille	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Grundfarbe des <u>jungen</u> Blattes	<u>Variedades bi- o multicolor solamente:</u> Limbo: color principal de la hoja joven		
yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Curly, Samantha	1
light yellowish green	vert jaunâtre clair	hell gelblichgrün	verde amarillento claro	Monique, Reginald	2
light green	vert clair	hellgrün	verde claro	Golden King, Marole	3
medium green	vert moyen	mittelgrün	verde medio	Exotic Monique	4
greyish green	vert grisâtre	gräulichgrün	verde grisáceo	Jennifer	5
dark green	vert foncé	dunkelgrün	verde oscuro		6
very dark green	vert très foncé	sehr dunkelgrün	verde muy oscuro		7

Example TG/171/3 Ficus benjamina

27. (*)	<u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: ground color of <u>mature leaf</u>	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: couleur de fond de la feuille <u>adulte</u>	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Grundfarbe des <u>ausgewachsenen Blattes</u>	<u>Variedades bi- o multicolor solamente:</u> Limbo: color principal de la hoja <u>adulta</u>		
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Curly	1
	light yellowish green	vert jaunâtre clair	hell gelblichgrün	verde amarillento claro	Reginald	2
	light green	vert clair	hellgrün	verde claro	Deborah	3
	medium green	vert moyen	mittelgrün	verde medio	Marole, Nightingale	4
	greyish green	vert grisâtre	gräulichgrün	verde grisáceo	Fiwama, Jennifer	5
	dark green	vert foncé	dunkelgrün	verde oscuro	De Gantel	6
	very dark green	vert très foncé	sehr dunkelgrün	verde muy oscuro	Vivian	7

Example TG/171/3 Ficus benjamina

28. (*)	<u>Varieties with bi- or multicolored leaf only:</u> Leaf blade: secondary color	<u>Variétés à feuilles bi- ou multicolores seulement:</u> Limbe: couleur secondaire	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt:</u> Blattspreite: Sekundärfarbe	<u>Variedades bi- o multicolor solamente:</u> Limbo: color secundario		
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Profit, Starlight	1
	light yellowish green	vert jaunâtre clair	hell gelblichgrün	verde amarillento claro	Golden King, Marole	2
	light green	vert clair	hellgrün	verde claro		3
	medium green	vert moyen	mittelgrün	verde medio		4
	greyish green	vert grisâtre	gräulichgrün	verde grisáceo		5
	dark green	vert foncé	dunkelgrün	verde oscuro	Bundy, Exotic Monique	6
	very dark green	vert très foncé	sehr dunkelgrün	verde muy oscuro		7

Example TG/171/3 Ficus benjamina

29. (*)	<u>Varieties with bi- or multicolored leaf</u> <u>only: Leaf blade: distribution of secondary color</u>	<u>Variétés à feuilles bi- ou multicolores</u> <u>seulement: Limbe: répartition de la couleur secondaire</u>	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt: Blattspreite: Verteilung der Sekundärfarbe</u>	<u>Variedades bi- o multicolor solamente: Limbo: distribución del color secundario</u>		
	near main vein	près de la nervure médiane	nahe der Mittelrippe	cerca de la vena principal	Reginald, Vivian	1
	near margin	près du bord	nahe des Randes	cerca del margen	Golden King, Profit	2
	randomly spread	distribuée au hasard	zufällig verteilt	distribuido al azar	Mandy	3

Example TG/171/3 Ficus benjamina

30.	<u>Varieties with multicolored leaf</u> <u>only: Leaf blade: tertiary color</u>	<u>Variétés à feuilles multicolores</u> <u>seulement: Limbe: couleur tertiare</u>	<u>Nur Sorten mit mehrfarbigem Blatt: Blattspreite: Tertiärfarbe</u>	<u>Variedades multicolor solamente: Limbo: tercer color</u>		
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	Jennifer	1
	light yellowish green	vert jaunâtre clair	hell gelblichgrün	verde amarillento claro		2
	light green	vert clair	hellgrün	verde claro		3
	medium green	vert moyen	mittelgrün	verde medio		4
	greyish green	vert grisâtre	gräulichgrün	verde grisáceo	De Gantel, Profit	5
	dark green	vert foncé	dunkelgrün	verde oscuro		6

Example TG/171/3 Ficus benjamina

31. (*)	<u>Varieties with bi- or multicolored leaf</u> <u>only: Leaf blade: area of ground color compared to area of other color(s)</u>	<u>Variétés à feuilles bi- ou multicolores</u> <u>seulement: Limbe: surface de la couleur de fond par rapport à la surface des autres couleurs</u>	<u>Nur Sorten mit zwei- oder mehrfarbigem Blatt: Blattspreite: Fläche der Grundfarbe im Verhältnis zur Fläche der anderen Farben</u>	<u>Variedades bi- o multicolor solamente: Limbo: superficie del color principal comparada con la superficie de los demás colores</u>		
	very small	très petite	sehr klein	muy pequeña	Samantha	1
	small	petite	klein	pequeña		3
	medium	moyenne	mittel	media	Francis	5
	large	grande	groß	grande	Nina	7
	very large	très grande	sehr groß	muy grande	Jennifer, Nikita	9

Example TG/171/3 Ficus benjamina

32.	Leaf blade: color of main vein	Limbe: couleur de la nervure médiane	Blattspreite: Farbe der Mittelrippe	Limbo: color del nervio principal		
	yellowish white	blanc jaunâtre	gelblichweiß	blanco amarillento	De Gantel, Profit	1
	yellowish	jaunâtre	gelblich	amarillento	Jennifer, Reginald	2
	light green	vert clair	hellgrün	verde claro	Marjolein	3
	medium green	vert moyen	mittelgrün	verde medio	Crespada, Exotica	4
	dark green	vert foncé	dunkelgrün	verde oscuro		5

Example TG/171/3 Ficus benjamina

33.	Leaf blade: degree of color contrast of venation	Limbe: degré du contraste de la couleur des nervures	Blattspreite: Stärke des Farbkontrasts der Rippen	Limbo: grado del contraste de color de las nervaduras		
	weak	faible	gering	débil	Natasja, Vivian	3
	medium	moyen	mittel	medio	De Gantel, Nina	5
	strong	fort	stark	fuerte	Francis, Jennifer	7

3.3.3 Distribution of color can be important, especially in the case of single colored

Example: Gerbera TG/77/9

33.	<u>Single colored varieties only: Outer ray floret only: distribution of color</u>	<u>Seulement pour les variétés unicolores: Fleur ligulée externe uniquement: répartition de la couleur</u>	<u>Nur einfarbige Sorten: Nur äußere Zungenblüte: Verteilung der Farbe</u>	<u>Variedades de un solo color únicamente: Flor ligulada exterior únicamente: distribución del color</u>		
	none	nulle	fehlend	ausente	Ferrari, Indian-Summer	1
	lighter towards base	plus claire vers la base	heller zur Basis	más claro en la base	Planper	2
	lighter towards top	plus claire vers le sommet	heller zum oberen Ende	más claro en la parte superior	Indian-Summer, Nevada	3

3.3.4 Color description of a petal

Example: Clematis TG/251/1

41. (* (*) (*)	(c) <u>Varieties with one color only:</u> Sepal: color distribution of upper side	<u>Variétés à une couleur seulement:</u> Sépale: répartition des couleurs de la face supérieure	<u>Nur Sorten mit einer Farbe:</u> Kelchblatt: Verteilung der Farbe der Oberseite	<u>Sólo variedades con un color:</u> Sépalo: distribución del color en la cara superior		
QN	lighter towards middle	plus claire vers le milieu	heller zur Mitte	más claro hacia el medio	Ville de Lyon	1
	even	régulière	gleichmäßig	uniforme	Lady Northcliffe	2
	lighter towards margins	plus claire vers les bords	heller zu den Rändern	más claro hacia los bordes	Evione	3

Example: Clematis TG/251/1

43. (* (*) (*)	(c) <u>Varieties with more than one color only:</u> Sepal: distribution of secondary color on upper side	<u>Variétés à plusieurs couleurs seulement:</u> Sépale: répartition de la couleur secondaire sur la face supérieure	<u>Nur Sorten mit mehr als einer Farbe:</u> Kelchblatt: Verteilung der Sekundärfarbe an der Oberseite	<u>Sólo variedades con más de un color:</u> Sépalo: distribución del color secundario en la cara superior		
PQ	edged	bordée	am Rand	ribeteado	Little Nell	1
	central bar	barre centrale	Mittelstreifen	raya central	Nelly Moser	2
	speckled	tachetée	gefleckt	manchado	Freckles	3
	along veins	le long des nervures	entlang der Adern	a lo largo de los nervios	Pagoda, Tango	4

3.3.5 Color and age

Example: TG/094/6 Calluna

18. (* (*)	<u>Varieties with opening buds only:</u> Flower: color of outer side of petal at beginning of flowering	<u>Seulement variétés avec bourgeons qui s'ouvrent:</u> Fleur: couleur de la face externe du pétale au début de la floraison	<u>Nur offenblühende Sorten:</u> Blüte: Farbe der Außenseite des Blütenblattes bei Blühbeginn	<u>Solo variedades con yema que se abre:</u> Flor: color de la parte exterior del pétalo al inicio de la floración		
	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		

Example: TG/094/6 Calluna

19. Varieties with opening buds only: Flower: color of outer side of petal at the end of flowering	Seulement variétés avec bourgeons qui s'ouvrent: Fleur: couleur de la face externe du pétale à la fin de la floraison	Nur offenblühende Sorten: Blüte: Farbe der Außenseite des Blütenblattes bei Blühende	Solo variedades con yema que se abre: Flor: color de la parte exterior del pétalo al final de la floración
RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)

Example: TG/86/5 Anthurium

(*)37. Spadix: main color of distal part shortly before dehiscence of anthers	white	blanc	weiss		1
	yellow	jaune	gelb	Arinos	2
	orange	orange	orange	Gloria	3
Spadice: couleur principale de la partie distale immédiatement avant la déhiscence des anthères	red	rouge	rot	Lipstick	4
	red purple	pourpre rouge	rotpurpur	Southern Blush	5
	purple	violet	purpur	Purple Rain	6
Kolben: Hauptfarbe des distalen Teils kurz vor dem Pollenstäuben	green	vert	grün	Calypso	7
	brown	brun	braun	Antco	8

Example: TG/86/5 Anthurium

39. Spadix: main color of distal part shortly after dehiscence of anthers	white	blanche	weiss		1
	yellow	jaune	gelb	Apollo	2
	orange	orange	orange	Niky	3
Spadice: couleur principale de la partie distale immédiatement après la déhiscence des anthères	red	rouge	rot		4
	red purple	pourpre rouge	rotpurpur	Rodeo	5
	purple	pourpre	purpur	Anetta	6
Kolben: Hauptfarbe des distalen Teils kurz nach dem Pollenstäuben	green	verte	grün		7
	brown	brune	braun		8

3.3.6 Color patterns

3.3.6.1 Stripes

Example: TG/29/6 Alstroemeria

(*)17.	Outer tepal: stripes	absent	absente	fehlend	Carmen	1
(+)	on inner side of blade	present	présente	vorhanden	Stalis	9
	Tépale externe: striation de la face interne du limbe					
	Aeusseres Tepalum: Streifen auf der Innenseite der Spreite					

Example: TG/29/6 Alstroemeria

(*)18.	<u>Outer tepal</u> : number of stripes on inner side of blade	few	petit	gering	Stalilas	3
(+)		medium	moyen	mittel	Staltang	5
	Tépale <u>externe</u> : nombre des stries de la face interne du limbe	many	grand	gross	Bestseller	7
	<u>Aeusseres</u> Tepalum: Anzahl Streifen auf der Innenseite der Spreite					

Example: TG/29/6 Alstroemeria

21.	<u>Inner lateral</u> tepal: number of stripes on inner side of blade	few	petit	gering	Stapink	3
(+)		medium	moyen	mittel	Carmen	5
	Tépale <u>interne latéral</u> : nombre de stries de la face interne du limbe	many	grand	gross	Ornate	7
	<u>Inneres laterales</u> Tepalum: Anzahl Streifen an der Innenseite der Spreite					

Example: TG/29/6 Alstroemeria

(*)22.	Inner lateral tepal:	small	petites	klein	Bestseller	3
(+)	size of stripes on inner side of blade	medium	moyennes	mittel	Carmen	5
	Tépale interne latéral: taille des stries de la face interne du limbe	large	grandes	gross	Stalan	7
	Inneres laterales Tepalum: Streifengrösse an der Innenseite der Spreite					

3.3.6.2 Crops with a very large variation of color patterns like in Phalaenopsis

Example: TG/213/1 Phalaenopsis

34. (*)	(b) Lateral sepal: color pattern	Sépale latéral: répartition de la couleur	Seitliches Kelchblatt: Farbverteilung	Sépalo lateral: distribución del color		
QL	evenly colored	de couleur uniforme	gleichmäßig gefärbt	color parejo		1
	shaded	dégradée	schattiert	sombreado	Kahori ‘Cupid’	2
	edged	bordée	gerändert	ribeteado	Cherry Song ‘Doll’	3
	striped	striée	gestreift	estriado		4
	netted	réticulée	netzartig	reticulado	Happy Sheena ‘Koala’	5
	spotted	tachetée	gefleckt	manchado	Carmen ‘Himiko’	6
	shaded and striped	dégradée et striée	schattiert und gestreift	sombreado y estriado		7
	shaded and netted	dégradée et réticulée	schattiert und netzartig	sombreado y reticulado		8
	shaded and spotted	dégradée et tachetée	schattiert und gefleckt	sombreado y manchado		9
	striped and spotted	striée et tachetée	gestreift und gefleckt	estriado y manchado		10
	edged and striped and spotted	bordée, striée et tachetée	gerändert, gestreift und gefleckt	ribeteado, estriado y manchado		11

Example: TG/25/8 Dianthus

(*)48. Petal: color distribution of blade (claw excluded)	picotee	picoté	gezackt	Lonkorpi, Maj Britt	1
	edged	bordé	gerändert	Corrida, Exquisite	2
Pétale: répartition des couleurs du limbe (onglet exclu)	striated	strié	gestreift	G.J. Sim, Stan- arthur, Telstar	3
	speckled	tacheté (tiqueté)	gefleckt		4
Blütenblatt: Art der Farbverteilung der Spreite (Nagel ausgenommen)	picotee-striated	picoté-strié	gezackt-gestreift	Lonbalma, Ostara	5
	picotee-speckled	picoté-tacheté	gezackt-gefleckt	Finbar	6
	edged-striated	bordé-strié	gerändert-gestreift		7
	edged-speckled	bordé-tacheté	gerändert-gefleckt		8
	picotee-striated-speckled	picoté-strié-tacheté	gezackt-gestreift-gefleckt	Kogiallo, Lanathena	9
	edged-striated-speckled	bordé-strié-tacheté	gerändert-gestreift-gefleckt		10
	striated-speckled	strié-tacheté	gestreift-gefleckt	Kolilac	11
	shading off	dégradée	abschattiert	Primeur	12
flushed	floue	verschwommen	Aleksis, Polka	13	

3.3.6.3 Veining: different color around the veins of the flower

Example: TG/212/1 Petunia

27. (*)	Corolla lobe: conspicuousness of veins on upper side	Lobe de la corolle: netteté des nervures sur la face supérieure	Kronlappen: Ausprägung der Aderung an der Oberseite	Lóbulo de la corola: evidencia de los nervios de la parte superior		
QN	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o débil	Conbloss	1
	weak	faible	gering	débil	Klefapurle	3
	medium	moyenne	mittel	media	Limelight	5
	strong	forte	stark	fuerte	Duesurimrosevein	7
	very strong	très forte	sehr stark	muy fuerte		9

3.3.6.4 Shading

Example: TG/209/1 Dendrobium

64.	(c) Varieties with shaded petals only: Petal: color of shading	Variétés à pétales dégradés seulement: Pétale: couleur du dégradé	Nur Sorten mit schattierten Blütenblättern: Blütenblatt: Farbe der Schattierung	Sólo variedades de pétalos sombreados: Pétalo: color del sombreado
PQ	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)

3.3.7 The Eye of a flower

Example: TG/214/1 Catharanthus

16. (* (+)	(c) Flower: eye zone	Fleur: zone autour de l'œil	Blüte: Augenzone	Flor: zona del ojo		
QL	absent	absente	fehlend	ausente	Papion Silver Blue	1
	present	présente	vorhanden	presente	Peppermint Cooler	9

Example: TG/214/1 Catharanthus

17. (*	(b) Flower: size of eye zone relative to flower size	Fleur: taille de la zone autour de l'œil par rapport à la taille de la fleur	Blüte: Größe der Augenzone im Verhältnis zur Größe der Blüte	Flor: tamaño de la zona del ojo en relación con el tamaño de la flor		
QN	small	petite	klein	pequeña	Peppermint Cooler	3
	medium	moyenne	mittel	media	Pretty in Pink	5
	large	grande	groß	grande	Dawn Carpet	7

Example: TG/214/1 Catharanthus

18. (*	Flower: number of colors of eye zone	Fleur: nombre de couleurs dans la zone autour de l'œil	Blüte: Anzahl Farben der Augenzone	Flor: número de colores en la zona del ojo		
QL	one	une	eine	uno		1
	two	deux	zwei	dos		2
	more than two	plus de deux	mehr als zwei	más de dos		3

Example: TG/214/1 Catharanthus

19.	<u>Varieties with one color of eye zone only</u> : Flower: border of eye zone	<u>Variétés avec une couleur d'une zone autour de l'œil seulement</u> : Fleur: bord de la zone autour de l'œil	<u>Nur Sorten mit einer Farbe der Augenzone</u> : Blüte: Rand der Augenzone	<u>Sólo variedades con un color de zona de ojo</u> : Flor: borde de la zona del ojo	
QL	sharp	net	klar abgegrenzt	definido	1
	diffuse	diffus	diffus	difuso	2

Example: TG/214/1 Catharanthus

20. (*)	(c) <u>Flower: color of inner eye zone</u>	<u>Fleur: couleur de la zone interne autour de l'œil</u>	<u>Blüte: Farbe der inneren Augenzone</u>	<u>Flor: color del interior de la zona del ojo</u>	
PQ	RHS Colour Chart (indicate reference number)	Code RHS de couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)	

Example: TG/214/1 Catharanthus

21. (*)	(c) <u>Varieties with more than one eye zone color only</u> : Flower: color of outer eye zone	<u>Variétés avec plusieurs zones autour de l'œil seulement</u> : Fleur: couleur de la zone externe autour de l'œil	<u>Nur Sorten mit mehr als einer Augenzonenfarbe</u> : Blüte: Farbe der äußeren Augenzone	<u>Sólo variedades con más de un color en la zona del ojo</u> : Flor: color del exterior de la zona del ojo	
PQ	RHS Colour Chart (indicate reference number)	Code RHS de couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)	

3.3.8 Macule

Example: TG/108/3 Gladiolus

(*) 32.	<u>Median outer segment of perianth: presence of macule</u>	absent	absente	fehlend	Albus, Charm	1
		present	présente	vorhanden	Groene Specht, Nymph	9
	<u>Segment extérieur médian du périanthe: présence d'une macule</u>					
	<u>Mittleres Aussensegment der Blütenhülle: Vorhandensein eines Fleckes</u>					

Example: TG/108/3 Gladiolus

33. <u>Median outer</u> segment of perianth: size of macule compared to that of segment	very small	très petite	sehr klein	Praha	1
	small	petite	klein	Groene Specht, Jessica	3
	medium	moyenne	mittel	Nymph, Pegasus	5
	large	grande	gross	Princess Mary Rose, Treasure	7
Segment <u>extérieur médian</u> du périanthe: taille de la macule par rapport à celle du segment	very large	très grande	sehr gross		9
<u>Mittleres Aussensegment</u> der Blütenhülle: Grösse des Fleckes im Verhältnis zu der des Segments					

Example: TG/108/3 Gladiolus

(*) 34. <u>Median outer</u> segment of perianth: shape of the macule	type 1	type 1	Typ 1	Mykonos, Peter Pears	1
	type 2	type 2	Typ 2	Groene Specht, Nymph, Princess Mary Rose	2
Segment <u>extérieur médian</u> du périanthe: forme de la macule	type 3	type 3	Typ 3	Mary Hously, Spic and Span	3
<u>Mittleres Aussensegment</u> der Blütenhülle: Form des Fleckes	type 4	type 4	Typ 4	Jessica, Praha	4
	type 5	type 5	Typ 5		5

Example: TG/108/3 Gladiolus

(*) 35. <u>Median outer</u> segment of perianth: color of macule	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	
Segment <u>extérieur médian</u> du périanthe: couleur de la macule	
<u>Mittleres Aussensegment</u> der Blütenhülle: Farbe des Fleckes				

3.4.1 Observation of fruits/berries in the ornamental sector

Example: TG/126/1 Hypericum

35. (b) Berry: main color (* (+)	Baie: couleur principale	Beere: Hauptfarbe	Baya: color principal
PQ	RHS Colour Chart (indicate reference number)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)

Example: TG/126/1 Hypericum

34. (b) Berry: color group (*	Baie: groupe de couleurs	Beere: Farbgruppe	Baya: grupo de color		
PQ	white	blanche	weiß	blanco	1
	cream	crème	cremefarben	crema	Bonaire 2
	green	verte	grün	verde	SJK 100 3
	brownish green	vert-brunâtre	bräunlichgrün	verde amarronado	Kolmgreen 4
	yellow	jaune	gelb	amarillo	Bosaarc 5
	orange	orange	orange	naranja	6
	light pink	rose clair	hellrosa	rosa claro	Esmamber 7
	pink	rose	rosa	rosa	Kolmsweet 8
	dark pink	rose foncé	dunkelrosa	rosa oscuro	9
	red pink	rosé	rotrosa	rosa rojizo	SJK 93 10
	orange red	orangé	orangerot	rojo anaranjado	Esmmayor 11
	light red	rouge clair	hellrot	rojo claro	Bright Blossom 12
	red	rouge	rot	rojo	Bosapin 13
	dark red	rouge foncé	dunkelrot	rojo oscuro	14
	red purple	violacé	rotpurpurn	púrpura rojizo	Pamela 15
	red brown	brun rouge	rotbraun	marrón rojizo	Esmmarron 16
	purple brown	brun pourpre	purpurbraun	marrón purpúreo	Autum Blaze, Excellent Flair 17
	brown	brune	braun	marrón	18
	grey brown	brun gris	graubraun	marrón grisáceo	19

3.4.2 Observations of fruits in the fruit sector

3.4.2.1 Ground color of the fruit

Example: TG/14/9 Malus

(*) 35.	Fruit: amount of over color	absent or very low	absente ou très faible	fehlend oder sehr gering	Granny Smith	1
	Fruit: importance de la couleur du lavis	low	faible	gering	Cox's Orange Pippin	3
		medium	moyenne	mittel	Gala	5
	Frucht: Anteil des mit Deckfarbe bedeckten Teiles	high	forte	hoch	Spartan	7
		very high	très forte	sehr hoch	New Europe	9

3.4.2.2 Over color of the fruit

Example: TG/14/9 Malus

37.	Fruit: intensity of over color	light	claire	hell		3
		medium	moyenne	mittel		5
	Fruit: intensité de la couleur du lavis	dark	foncée	dunkel		7
	Frucht: Intensität der Deckfarbe					

Example: TG/14/9 Malus

(*) 38.	Fruit: pattern of over color of skin	only solid flush	seulement en plages continues	nur ganzflächig	Richared Delicious	1
	Fruit: répartition de la couleur couvrante de l'épiderme	only striped	seulement en stries	nur gestreift	Jupiter	2
	Frucht: Ausbreitungsform der Deckfarbe der Schale	solid flush with stripes	plages continues avec des stries	ganzflächig mit Streifen	Galaxy, Starking	3
		mottled	mouchetée	punktiert	Elstar	4
		washed out	délavée	verwaschen	Gloster	5

Example: TG/14/9 Malus

(*) 39.	Fruit: amount of russet around eye basin	absent or very low	absente ou très faible	fehlend oder sehr gering		1
	Fruit: importance du liège autour de la cuvette de l'oeil	low	faible	gering		3
		medium	moyenne	mittel	Cox's Orange Pippin	5
	Frucht: Berostung im Bereich der Kelchgrube	high	forte	stark	Arlet	7
		very high	très forte	sehr stark		9

[Annex B follows]

ANNEX B: INTRODUCTION TO RHS COLOUR CHARTS

The Royal Horticultural Society's Colour Chart

■ THE *RHS COLOUR CHART* is the standard reference for specifying flower colour. Since its first publication in 1966 it has been used extensively by the Royal Horticultural Society, growers, registration authorities and specialist organisations such as the International Union for the Protection of new Varieties of Plants (UPOV) to identify and describe plant colour precisely.

The Chart is essential for accurately identifying the colours of flowers and fruits. It can be used to compare colour variation within a species or through the process of aging, or where the basic colour is overlaid with a 'blotch'. The Chart is equally useful for describing the variegations, blotching and coloured veining found in leaves, and the shading and colour variation in stems.

In this fourth edition of the *RHS Colour Chart*, all the colours are printed in solid colour. In previous editions some of the colours in the red-purple and blue range were printed using the four-colour printing process as they were particularly difficult to match using the paint materials available at that time. However, due to the instability of this process, in this edition we have made all the colours solid. Inevitably, this has meant that some could not be matched exactly to previous editions. To ensure that the Chart remains an accurate record, the numbers of any inexact matches are now preceded by the letter 'N' for new colour, e.g. N66. Any written references to these colours must include the letter N.

To improve the range of the Chart, also included in this edition are 76 new colours, mostly in the dark purple and orange-red ranges. All new colours have been inserted between existing colours and have the letter N preceding the number. For example, the red-purple chart will run 77, N77, 78, 79, N79, 80, etc.

The colour patches for this edition were matched with great care against an original example of the 1966 and 1995 editions to ensure the original colour classification is maintained. Matching was done under three standard light sources to avoid colour differences in varying light conditions: artificial light, an artificial daylight simulation bulb (D65), and TL84, a warm light source commonly found in warehouses. All colour measurements were checked using a spectrophotometer.

The dimensions of colour

■ ANY COLOUR can be defined in terms of three 'dimensions' or attributes: hue, brightness and saturation.

Hue distinguishes the kind of colour - whether it is a red, a green or a blue. This applies whether the colour is intense or greyed.

Brightness distinguishes the total amount of light reflected by the colour; in other words the colour's luminosity or tone. Brightness may also be expressed as how the colour is perceived by the normal eye on the light to dark scale.

Saturation, intensity, is the attribute which determines the purity or greyness of the colour. Spectral colours are fully saturated, or at the maximum intensity, that the normal eye can appreciate. Any mixture with another colour, or with white or grey, reduces the saturation or intensity.

How the colours are arranged

■ SINCE THERE are three 'dimensions' for every colour it is not possible to arrange them in a single linear scale. They are, therefore, arranged in order of the fully saturated colours with the less saturated and less bright colours in their appropriate places alongside.

The colour groups proceed through the spectrum starting with yellow, through orange, red, purple, violet, blue, green and back to yellow. The names of intermediate groups are formed by adding the name of the next colour in the sequence. Thus Fan 1 is formed of Yellow, Yellow-Orange, Orange, Orange-Red and Red groups.

Some of the most strongly 'greyed' (unsaturated dull colours) which would make a violent visual break in their proper order, have been placed separately in Fan 4.

The Chart is formed of 221 sheets grouped into four fans. Each sheet is headed by a group name and bears four colour patches lettered A to D. A colour is specified by a group name, a sheet number and a letter e.g. Yellow-Orange Group 19A, Red Group 41B.

It may at first seem illogical to find a colour more people would describe as 'pink', for example, grouped under the heading red. However group names are given for reference, and are not intended for use as colour names. The multiplicity of common names needed to describe all 884 colours on the Chart would defeat their object. Colour memory is rarely good enough to remember exactly what a named colour is like, and some names are meaningless to the great majority of people. Rhodamine purple or langite green are unlikely to conjure up a precise mental picture. Rose pink and primrose yellow may mean different colours to different people.

How to use the chart

■ THE FOLLOWING suggestions are made to ensure as much uniformity of use as is possible:

1. Use natural north light, not artificial light or direct sunlight. If this is impossible, always use the Chart in indirect light and standardise conditions as far as possible; an artificial daylight simulation bulb (D65) is suitable if used consistently.
2. Place object under the hole in the colour patch or alongside the patch.
3. Transparent objects should always be matched against the same uniform background; the last sheet of the fan is ideal for this purpose.
4. For a general description of a flower colour take two or three average blooms just fully open for matching. Flower colours change as the flower develops. There may be coloured veining or blotching present, or the basic colour may be overlaid with a 'bloom'. For more detail flowers can be matched:
 - in bud, just before breaking;
 - completely open, as near perfection as possible;
 - fully open to fading (there is often a distinct change of colour at this stage).
5. The Chart can also be used to match leaf variegation or stem colour. Take two or three examples representative of the plant as a whole.
6. Not every plant will find a perfect colour match as intimate mixtures of variable colour over a flower, in particular, can defy precise matching.
7. Never attempt to match colour if the eye has become fatigued.

Care of the Colour Chart

- AFTER USE close the fan or fans and replace them in the box immediately. Never leave fans open or the colours will fade.
- In order to preserve the colours do not expose the chart to sunlight unnecessarily.

Text adapted from the Royal Horticultural Society's Colour Chart (2001)

[End of Annex B and of document]