Guidelines

For the Conduct of Test for

Distinctiveness, Uniformity and Stability

on

DAHLIA (*Dahlia spp*)

Protection of Plant Varieties and Farmers' Rights Authority (A Statutory Body created by an Act of Parliament)

Government of India, New Delhi

Contents

Dahlia spp.

I. Subject

These test guidelines shall apply to all *Dahlia* species and their hybrids

II. Plant Material Required

1. The Protection of Plant Varieties & Farmers' Rights Authority (PPV&FRA) shall decide when, where and in what quantity and quality the plant material are required for testing of a variety denomination for registration under the Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001. Applicants submitting plant material from a country other than India must ensure that all customs, quarantines and other regulatory formalities are complied with.

2. The planting material is to be supplied in the form of rooted cuttings. The minimum quantity of planting material of each cultivar/variety, to be supplied by the applicant, should be 200 rooted cuttings having 3-4 nodes (100 for each centre-50 for evaluation and 50 for propagation purpose).

4. The planting material supplied should be visibly healthy, free from disease, insects, pests and also not lacking in vigour.

5. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be supplied along with planting material.

6. Plant material shall also possess the highest genetic purity, uniformity, sanitary and phyto-sanitary standards.

III. Conduct of Tests

1. The minimum duration of test should normally be a single complete growing cycle for DUS test. However, in case the material entered does not meet the DUS criteria for any one or more than one character, then the test shall be extended for the next year

2. The test should be conducted at two test locations with three replications planted in the field for better expression of phenotypic characters. In case of non-

expression of any diagnostic character at that specific location, the test is to be shifted to other suitable location for further visual examination.

3. The tests should be carried out under conditions ensuring normal growth and expression of all test characteristics of the variety. The size of the plots shall be such that plants or parts of plants could be removed for measurement and observation without disturbing the other observations on the standing plants until the end of the growing period.

4. Each test should include 45 plants as per design given below:

Test plot design

1. Number of rows: 3
2. Row to row distance: 60 cm
3. Plant to plant distance: 40 cm
4. No. of plants/replication:15
5. Number of replications: 03
6. Design: RBD

5. Unless otherwise indicated, the optimum stage of development for the assessment of the characteristics is the time of full flowering.

6. Any kind of plant growth promoting hormones should not be used throughout the vegetative growth period and flowering.

7. If needed, additional test protocols for special purpose shall be established by the PPV&FR Authority.

IV. Methods and Observations

1. The characteristics described in the Table of Characteristics (Section VII) should be used for the testing of varieties for DUS.

2. Because daylight varies, colour determinations using a colour chart should be made in the middle of the day in a room without direct sunlight. These

determinations should be made with the plant part placed against a contrasting background.

3. For the assessment of Distinctiveness and Stability, observations should be made on 30 plants or parts of plants selected randomly, which should be divided among 3 replications (10 plants in each replication).

4. For the assessment of Uniformity of characteristics in the plot as a whole (visual assessment by a single observation of a group of plants or parts of plants), with an acceptance probability of at least 95% should be applied. This means only 2 off type plant/45 plants are acceptable.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of Distinctiveness. Characteristics which are suitable for grouping purposes are those, which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.

2. The following shall be used as grouping characteristics:

1. Leaf Anthocyanin (Characteristic 1)
2. Plant growth habit (Characteristic 4)
3. Stem anthocyanin (Characteristic 6)
4. Leaf colour (Characteristic 16)
5. Leaflet shape of base(Characteristic 20)
6. Flower head attitude (Characteristic 25)
7. Flower head type: Shape of flower (Characteristic 28)
8. Ray floret: Rolling of margin (Characteristic 34)
9. Flower colour: (Characteristic 42)

VI. Characteristics and Symbols

1. To assess Distinctiveness, Uniformity and Stability, the characteristics and their states as given in the Table of characteristics should be used.

2. Notes (1-9) should be used for the purpose of recording and electronic processing of data. Each state of expression is allotted a corresponding numerical note (1-9) for the different characteristics.

3. Legend

(*) Characteristics that should be used in vegetative and full flowering shall always be included in the description of the variety, except when the states of expression of any of these characters is rendered impossible by a preceding characteristic or by the environmental conditions of the testing region. Under such exceptional situation, adequate explanation shall be provided.

4. **QL:** Qualitative characteristic
   QN: Quantitative characteristic
   PQ: Pseudo-qualitative characteristic

A decimal code number in the VII column of Table of characteristics indicates the optimum stage for observation of each characteristic during the growth and development of the plant. The relevant growth stages corresponding to these decimal code numbers are described below:

Decimal code for the growth stage

S.No.	Code	Growth stage
1	20	Before initiation of terminal flower bud
2	50	Inflorescence or flower buds visible
3	70	50% of flowers open, first petals may be fallen
4	90	Maximum vegetative growth stage, foliage still green
5	100	Harvested product (post harvest or storage treatment is applied at stage 100)

5. Type of assessment of characteristics indicated in section VII of Table of characteristics is as follows:

MG: Measurement by a single observation 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 observations of individual plants or parts of plants.

VII. Table of Characteristics of Dahlia

S.No.	Characteristic	States	Notes	Stage of observation	Example varieties	Type of assessment
1	2	3	4	5	6	7
1 (+)QL	Leaf Anthocyanin	Absent	1	20	Matangini, Minu	**VG**
		Present	9		Black Eternity, Tenzing Norgay, Cooch Behar	
2 (+)QL	Bud anthocyanin	Absent	1	50	Matangini	**VG**
		Present	9		Black Eternity	
3 (+)QL	Position of terminal bud on stem	Straight	1	50	Giani Zail Singh	**VG**
		Curved	9		Tenzing Norgay	
4. (*) (+) PQ	Plant growth habit	Upright	3	70	Aditya, Agni, Giani Zail Singh, Shubhra	**VG**
		Spreading	7		Kamla, Minu	
5(*) QN	Plant Height (cm)	Very short (<50)	1	70	Black Eternity, Minu	**MS**
		Short (≥51-70)	3		Hiranmayee, Matangini, Gargi	
		Medium (≥ 70-90)	5		Giani Zail Singh, Good Day	
		Tall (≥ 90-110)	7		Kenya White, Kenya Blue	
		Very tall (>110)	9		Mother Teresa, Jishu, Cooch Behar	
6(*)(+) QL	Stem anthocyanin	Absent	1	70	Matangini, Minu, Dust Stone Orange	**VG**
		Present	9		Giani Zail Singh, Black Eternity, Tenzin Norgay	
7 (+)PQ(*)	Stem colour	Yellow Green 145B	3	70	Kenya Yellow, Matangini, Shubhra, Kenya Blue	**VG**

		Greyed Orange 177A	5		Tenzin Norgay, Aditya, Provujee, Giani Zail Singh	
		Greyed Purple 187A	7		Black Eternity	
8 (+)QN	Stem Girth (mm)	Thin (<9)	3	70	Dust Stone Red, Dust Stone Orange	**MS**
		Medium (≥ 9-14)	5		Giani Zail Singh, Glory of India, Gargi	
		Thick(>14)	7		Aditya, Matangini, Jishu, Glory of India	
9 (*) (+)QL	Leaf Type	Simple	3	70	Matangini, Kenya White	**VG**
		Pinnate	5		Hiranmayee, Black Eternity	
		Bipinnate	7		Eternity	
10 (+)QL	Leaf Wing	Absent	1	70	Aditya	**VG**
		Present	9		Gargi	
11QL	Leaf Texture	Hard	1	70	Kenya White, Glory of India, Gargi	**VG**
		Soft	9		Eternity, Dust Stone Red, Dust Stone Orange	
12(+)QL	Leaf glossiness	Absent	1	70	Glory of India	**VG**
		Present	9		Kenya Yellow, Shubhra	
13QL	Leaf pubescence	Absent	1	70	Aditya	**VG**
		Present	9		Matangini	
14. (+)QN	Leaf Length (cm)	Small (<10)	3	70	Shubhra, Kenya White	**MS**
		Medium(≥10 -20)	5		Giani Zail Singh	
		Large(>20)	7		Black Eternity, Hiranmayee	
15. (+)QN	Leaf Width (cm)	Narrow (<10)	3	70	Minu	**MS**
		Medium(≥10 -20)	5		Hiranmayee, Giani Zail Singh	
		Broad(>20)	7		Bhikhu's Mother	
16. (*) (+)PQ	Leaf colour RHS Colour charts (Indicate reference	Yellow Green (146A)	3	70	Agni,Giani Zail Singh, Lal Bai	**VG**
		Green 137A	5		Matangini, Gargi	

	number)	Purple Green (NN137A)	7		Black Eternity	
17 (*) (+)PQ	Leaf Tip	Pointed	1	70	Shubhra	**VG**
		Tapering	3		Aditya, Kenya Orange	
		Triangular	5		Matangini	
		Elongated	7		Agni	
18. (+)PQ	Leaf Shape	Ovate	3	70	Matangini	**VG**
		Elliptic	5		Black Eternity	
		Oblanceolate	7		Chitchor	
19. (+)PQ	Leaf vein	Depressed	3	70	Glory of India, Matangini	**VG**
		Flat	5		Kenya Blue, Eternity	
		Raised	7		Aditya, Giani Zail Singh	
20.(+) (*) PQ	Leaflet shape of base	Acute	1	70	Aditya	**VG**
		Obtuse	2		Kenya Yellow, Matangini	
		Rounded	3		Jishu	
		Asymmetric	4		Bhikhu's Mother	
		Truncate	5		Provujee	
		Cordate	6		Kenya Yellow	
21.QN	Peduncle length (cm)	Short (<20)	3	70	Eternity	**MS**
		Medium (≥20-40)	5		Hiranmayee, SP Kamla	
		Long (>40)	7		Kenya Yellow, Kenya Blue, Mother Teresa	
22. (+)PQ	Anthocyanin of peduncle	Absent	1	70	Matangini, Kenya Yellow, Kenya Blue	**VG**
		Present	9		Tenzing Norgay, Black Eternity	
23. (+)QN	Length of peduncle above leaf node (cm)	Short (<10)	3	70	Piusenia Pink, Gargi,	**MS**
		Medium (≥10-15)	5		Giani Zail Singh, Glory of India, Mother Teresa	
		Long (>15)	7		Kenya Blue, Tenzing Norgay	
24. (*)(+)PQ	Flower heads: position in relation to foliage	Below foliage	1	70	Tenzing Norgay, Eternity	**VG**
		At same level	5		Gargi, Hiranmoyee, Piusenia White	

		Above foliage	9		Jishu, Aditya, Kenya White	
25. (*)(+)PQ	Flower head attitude	Drooping	1	70	Gargi, Good Day, Piusenia White, Matangini	**VG**
		Horizontal	5		Agni, Dust Stone Red, Bhikhus Mother, Glory of India	
		Upright	9		Shubhra	
26 (+)QN	Flower head length (cm)	Short(<5)	3	70	Dust Stone Red, Minu	**MS**
		Medium(≥5-10)	5		Giani Zail Singh, Tenzing Norgay	
		Long> 10	7		Kenya Blue, Black Eternity Piusenia White	
27. (+)QN	Flower head diameter(cm)	Miniature(< 10)	1	70	Dust Stone Red, Dust Stone Orange	**MS**
		Small (≥10-15)	3		Hiranmoyee, Agni, Good Day, Kamla, Mother Teresa	
		Medium (≥15-17)	5		Eternity, Glory of India, Tenzing Norgay Piusenia White, Piusenia Pink	
		Large (≥17-20 cm)	7		Kenya Orange, Kenya Yellow, Jishu ,Gargi	
		Dinner- plate sized/Giant (>20 cm)	9		Cooch Behar, Matangini, Kenya Blue	
28. (*)(+)PQ	Flower head type	Single	1	70	Agni	**VG**
		Semi double	2		Lal Bai	
		Daisy eyed Double	3		Chitchor, Blackout	
		Double	4		Hiranmoyee, Piusenia White, Piusenia Pink	
		Decorative	5		Matangini, Kenya Blue	
		Pompon	6			
		Cactus	7			
					Duston Stone Red	
					Ketu	
29(+)QL	Flower collar segments	Absent	1	70	Hiranmayee	**VG**
		Present	9		Kamla	
30 QL	Flower Disc	Absent	1	70	Bhikhus Mother, Dust Stone Red, Kenya Orange	**VG**
		Present	9		Lal Bai, Kamla	

31.	Flower Disc	Yellow	3	70	Kamla	**VG**
(+)PQ	Colour	Orange	5		Lal Bai	
32. (+)PQ	Ray floret : upper surface	Smooth	3	70	Piusenia Pink	**VG**
		Keeled	5		Matangini, Hiranmoyee	
33. (*)(+)QN	Ray florets: No. of keels	One	3	70	Piusenia White	**VG**
		Two	5		Hiranmoyee, Kenya Orange	
		More than two	7		Matangini	
34. (+)PQ	Ray floret : rolling of margin	Involute	3	70	Dust Stone Red, Lal Bai, Matangini, Mother Teresa, Piusenia White	**VG**
		Flat (not rolled)	5		Tenzin Norgay	
		Revolute	7		Piusenia White, Kenya Orange	
35.QL	Ray floret : twisting	Absent	1	70	Giani Zail Singh, Gargi	**VG**
		Present	9		Aditya, Matangini	
36. (*)(+)PQ	Ray floret : shape of apex	Pointed	1	70	Aditya, Mother Teresa, Matangini, Piusenia White	**VG**
		Dentate	2		Kenya White	
		Rounded	3		Dust Stone Red	
		Tapering	4		Kenya Gerua	
		Dome	5		Agni	
		Twisted	6		Tenzin Norgay	
37 (+)QN	Length of Ray florets(cm)	Short(<5)	3	70	Giani Zail Singh	**MS**
		Medium(≥5-10)	5		Black Eternity	
		Long(>10)	7		Tenzin Norgay	
38(+)QN	Width of Ray florets(cm)	Narrow(<3)	3	70	Minu, Piusenia Pink	**MS**
		Medium(≥3-5)	5		Shubhra, Lal Bai	
		Broad(>5)	7		Aditya, Matangini	
39(+)PQ	Ray florets: Longitudinal axis	Incurving	3	70	Good Day	**VG**
		Straight	5		Eternity	
		Reflexing	7		Piusenia White, Good Day	

40. (*)(+)PQ	Ray floret : number of	Single	3	70	Aditya, Tenzing Norgay	**VG**
	colours	Bicoloured	5		Gargi, Giani Zail Singh, Mother Teresa	
		Multi-coloured	7		Good Day	
41 QL	Ray Floret: Colour of lower surface	Same	1	70	Shubhra, Matangini	**VG**
		Different	9		Mother Teresa	
42. (*)(+)PQ	Flower Colour : Ray floret primary colour(RHS colour charts)	White 155GWC	1	70	Matangini, Shubhra	**VG**
		Yellow 3BGYA	2		Kenya Yellow, Minu	
		Orange 25SOB	3		Gargi, Jishu	
		Red N45 MRAB	4		Dust Stone Red, Giani Zail Singh	
		Red Purple 59DRA	5		Tenzing Norgay	
		Purple NN 78SRPA	6		Glory of India	
43(+)PQ	Distribution of second colour of ray florets	At Tips	1	70	Mother Teresa	**VG**
		At basal	2		Lal Bai	
		At margins	3		Glory of India	
		Blended	4		Jishu	
44(+)QL	Ray floret : profile in cross section at mid point	Flat	3	70	Tenzin Norgay	**VG**
		Concave	5		Giani Zail Singh	
		Convex	7		Piusenia White	
45(+)QL	Ray floret :Position of twisting	Apical	3	70	Piusenia White	**VG**
		Middle	5		Kenya Gerua	
		Basal	7		Giani Zail Singh	
46(+)QL	Anthocyanin on Epicalyx	Absent	1	70	Matangini, Shubhra	**VG**
		Present	9		Black Eternity	
47 (+)QL	Shape of Epicaly	Rounded	3	70	Glory of India	**VG**
		Elongated	7		Jishu	

	x					
48 QN	Flowering period (No. of days after transplanting)	Early(<70)	3	70	Hiranmayee, Kenya Orange, Matungini	**MS**
		Mid (≥70-100)	5		Piusenia White, Piusenia Pink, Kamla	
		Late(>100)	7		Eternity, Aditya, Blackout	
49QN	Duration of flowering (days)	Short (<40)	3	90	Agni, Dust Stone Red	**MS**
		Medium(≥40-60)	5		Kamla, Matangini, Jishu	
		Long(>60)	7		Aditya, Kenya Yellow	
50QN	Vase life (days)	Short (<4)	3	100	Kenya White, Matangini	**MS**
		Medium(≥4-6)	5		Glory of India, Bhikhu's Mother	
		Long(>6)	7		Mother Teresa, Giani Zail Singh	
51(+) QL	Shape of Tuber	Rounded	1	100	Giani Zail Singh	**VG**
		Elongated	9		Hiranmayee, Kenya Orange, Matangini	

EXPLANATIONS AND METHODS

Explanations covering several characteristics unless otherwise indicated, all characteristics should be examined at the time of full flowering.

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

(a) Leaf characteristics are recorded on typical leaves taken from the middle third of the stem, and are recorded on the whole leaf regardless of the number of leaflets, looking at the upper surface.

(b) Ray floret length and width characteristics should be observed on the outermost row of ray florets.

(c) In all but single flowered varieties, all ray floret characteristics, other than length and width characteristics, should be observed on the most typical florets, excluding the innermost and outermost rows, unless otherwise stated.

(d) The main colour is the colour with the largest total surface area, the second colour (if present) is the colour with the second largest total surface area, and the

third colour (if present) is that with the third largest total surface area.

Explanations for individual characteristics

Characteristic1. Leaf anthocyanin

Absent (1)

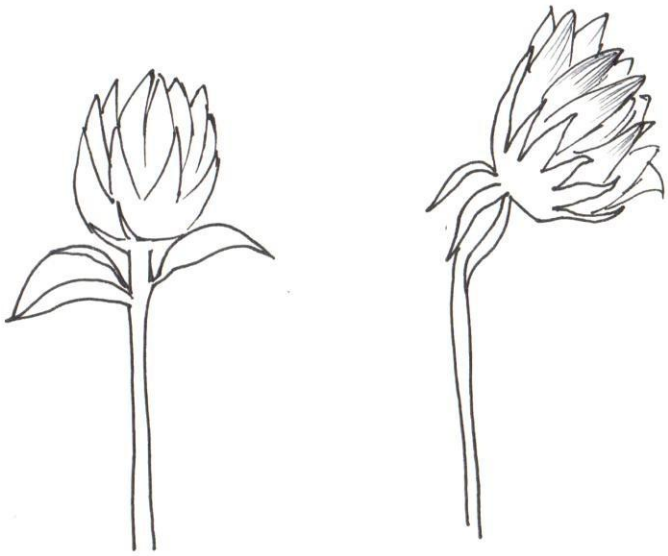
Present (9)

Characteristic 2: Bud anthocyanin

Absent (1)

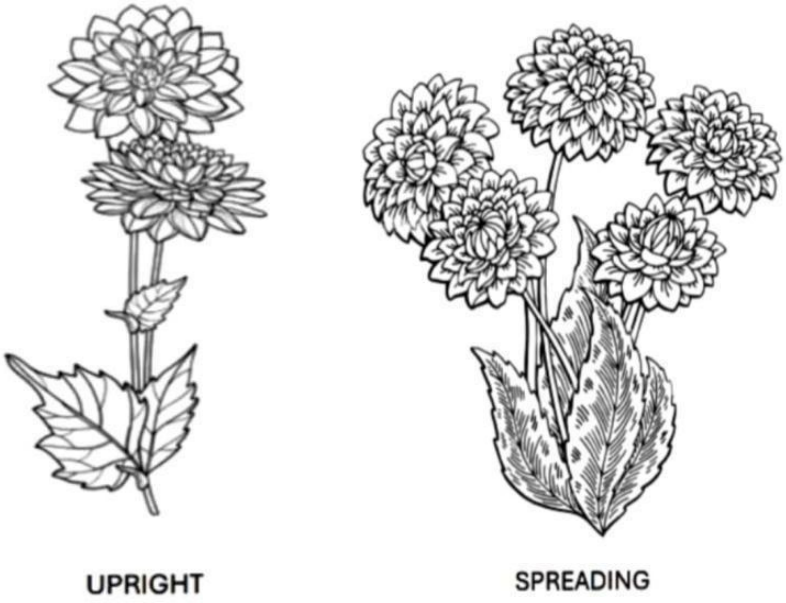
Present (9)

Characteristic 3: Position of terminal bud on stem



Straight (1) **Curved (9)**

Characteristic 4: Plant: growth habit



	
Upright (3)	**Spreading(7)**

Characteristic 6. Stem Anthocyanin

Absent (1) **Present (9)**

Mostly anthocyanin is absent in white and yellow flowering cultivars but present in pink, purple and other varieties

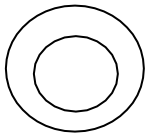
Characteristic 7: Stem colour: On the middle third of the stem, excluding the peduncle, the stem colour should be seen. These are to be matched with RHS colour charts

Yellow Green 145 B (3)

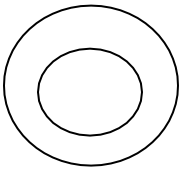
Greyed Orange 177A(7)

Green Purple 187A (5)

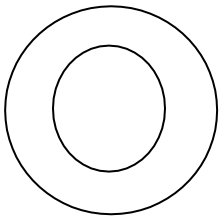
Characteristic 8: Stem girth



Thin (3)



Medium (5)



Thick(7)

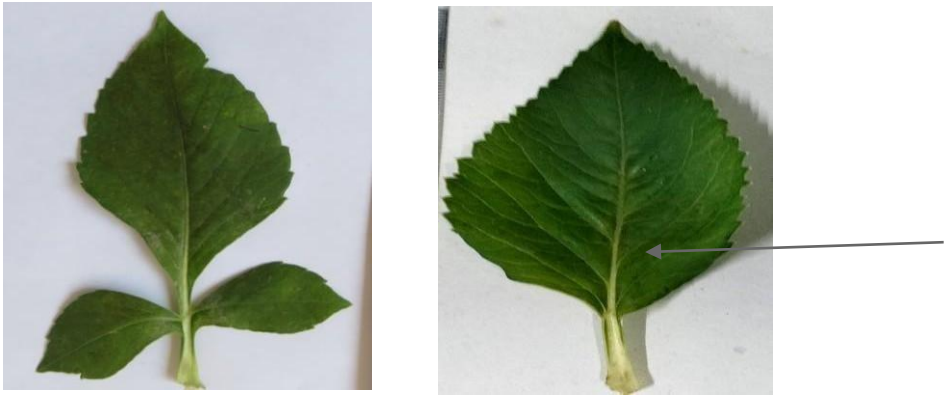
Characteristic 9: Leaf type: Several different leaf types are frequently found on each Dahlia variety plant, but the proportion of each type on the plant should be constant across varieties.

Simple (3) **Pinnate (5)** **Bipinnate (7)**

Characteristic 10. Leaf Wing

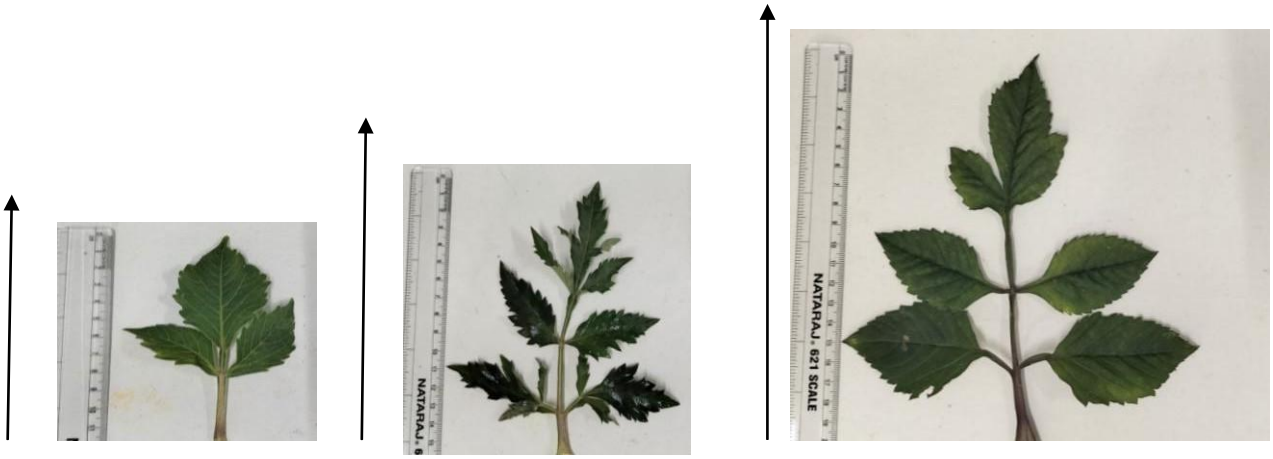
Absent (1) **Present (9)**

Characteristic 12. Leaf Glossiness



Absent (1) **Present (9)**

Characteristic 14. Leaf Length



Small(3) **Medium(5)** **Large(7)**

Characteristic 15. Leaf Width

Narrow (3) **Medium (5)** **Broad (7)**

Characteristic 16. Leaf colour

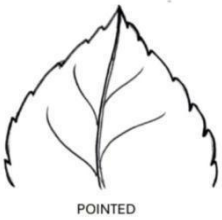
Leaf colours vary from shades of yellowish green to dark green

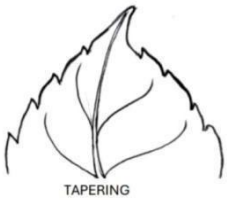
Yellow green 146A (3)

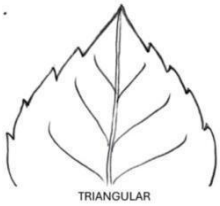
Green 137A(5)

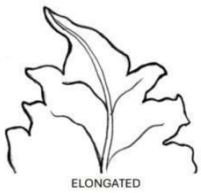
NN137A Purple Green(7)

Characteristic 17. Leaf Tips





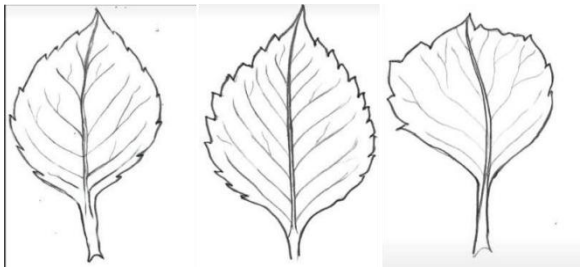




			
Pointed (1)	**Tapering (3)**	**Triangular (5)**	**Elongated(7)**

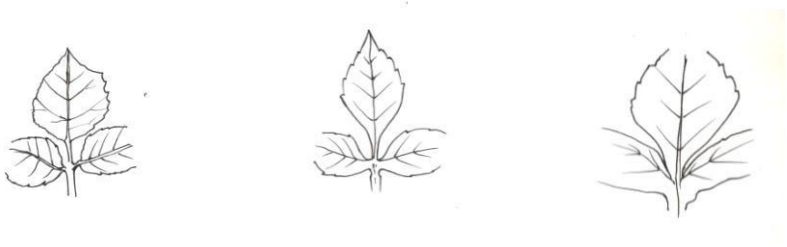
Characteristic 18. Leaf Shape

It should be recorded on the terminal leaflet for compound leaves and whole leaf in case of simple leaf



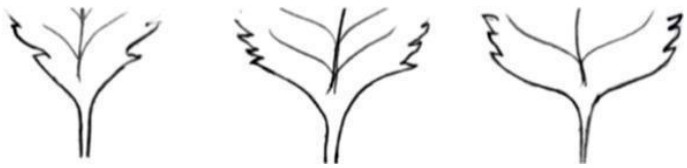
Ovate (3) **Elliptic (5)** **Oblanceolate(7)**

Characteristic 19. Leaf Vein



		
Depressed (3)	**Flat (5)**	**Raised (7)**

Characteristic 20. Leaflet shape of base: Although the shapes of the bases of asymmetric varieties may differ from one another, all varieties with asymmetric bases should be observed as state 4 for this characteristic.



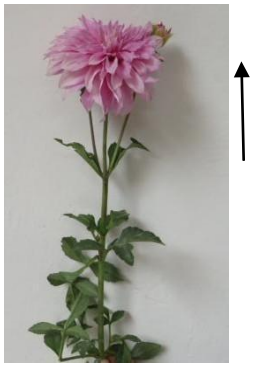
Acute(1) **Obtuse(2)** **Rounded (3)**

Asymmetric(4) **Truncate(5)** **Cordate (6)**

Characteristic 22: Anthocyanin of peduncle

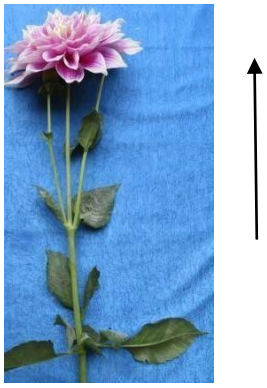
145 B Yellow Green (1) **NN137A Purple Green (2)**

Characteristic 23. Length of peduncle above leaf node



Short (3)

Medium (5)



Long(7)

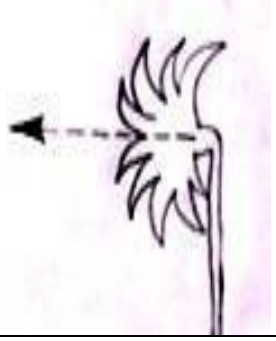
Characteristic 24. Flower Head: Position in Relation to Foliage

Below Foliage(1)

Same level (5)

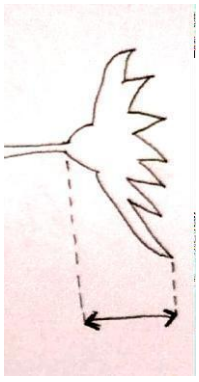
Above foliage (9)

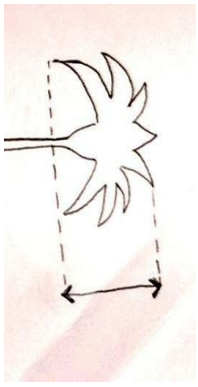
Characteristic 25. Flower Head Attitude



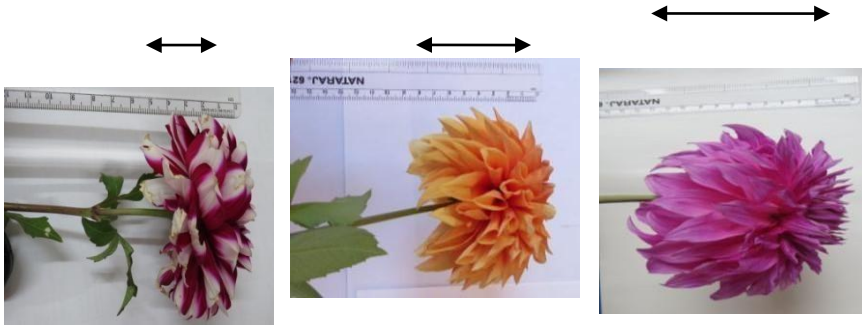
Drooping(1)	Horizontal (5)	Upright(9)

Characteristic 26: Flower head length



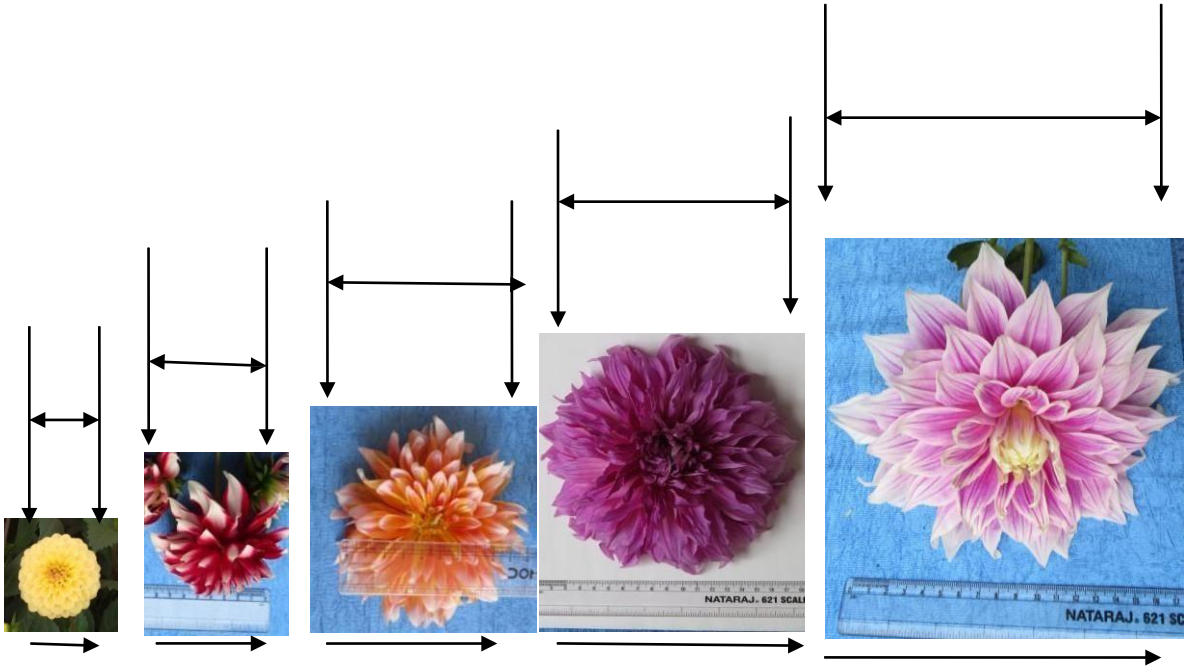


Small (3) **Medium(5)** **Large(7)**



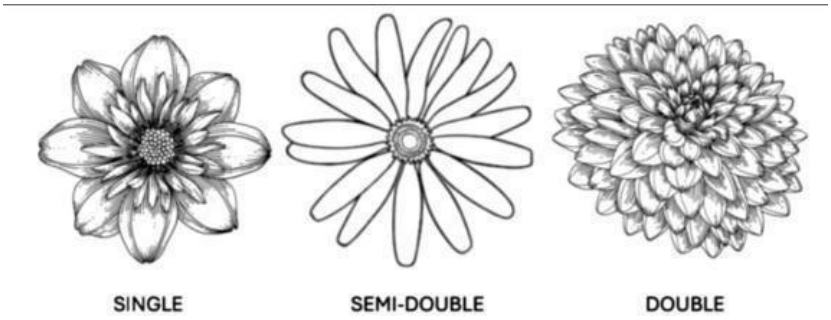
Small(3) **Medium(5)** **Large(7)**

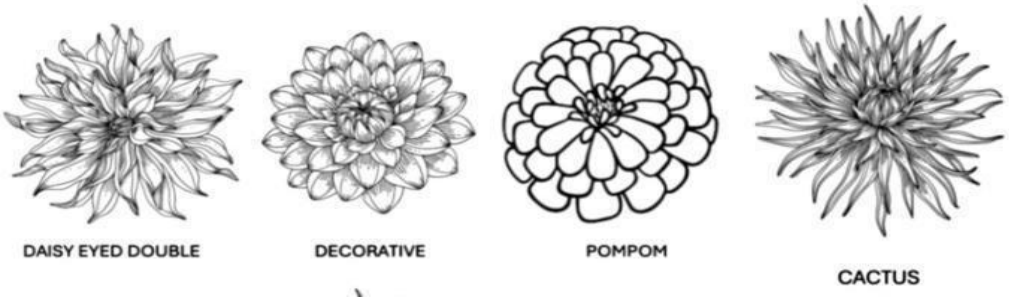
Characteristic 27: Flower head diameter



Miniature(1) **Small(3)** **Medium(5)** **Large(7)** **Dinner plate(9)**

Characteristic 28. Flower Head type





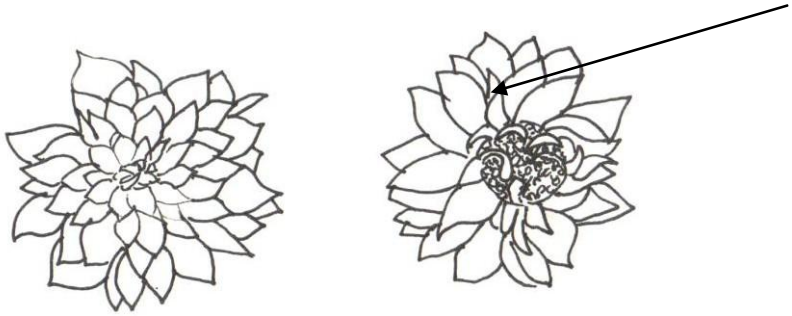
Single(1) **Semi-double(2)** **Double(3)**

Daisy eyed double(4) **Decorative(5)** **Pompon(6)** **Cactus(7)**

Characteristic 28. Flower Head type

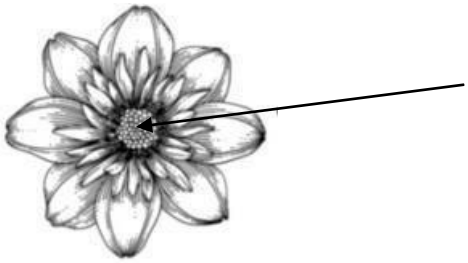
1. **Single:** Single flower heads with a single row of ray florets and an always-visible, well-defined central disc. The ray florets are in one whorl and disc is prominent.
2. **Semi-double:** Two or more rows of ray florets, surrounding a disc
3. **Double:** double flower heads that lack a disc at any point during the flowering process.
4. **Daisy-eyed double:** double flower heads with a disc that, while not initially visible during flowering, becomes visible as the flower head fully opens. Sometimes it is difficult to identify the disc.
5. **Decorative flowered:** The ray florets are in multi-whorled and disc is absent. The florets are properly arranged, open wide and tips are rounded.
6. **Pompon dahlias:** The ray florets are multi-whorled and cup shaped and arranged in upward position making it a compact ball type appearance, disc is absent.
7. **Cactus:** The ray florets are narrow, turned, pointed, double type. Disc is absent

Characteristic 29: Flower collar segments



Absent(1) **Present(9)**

Characteristic 30: Flower disc

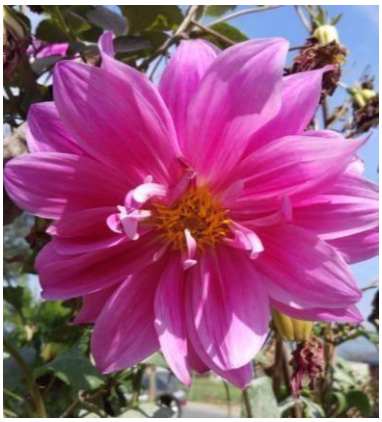


Absent(1)

Present (9)

Characteristic 31: Disc colour

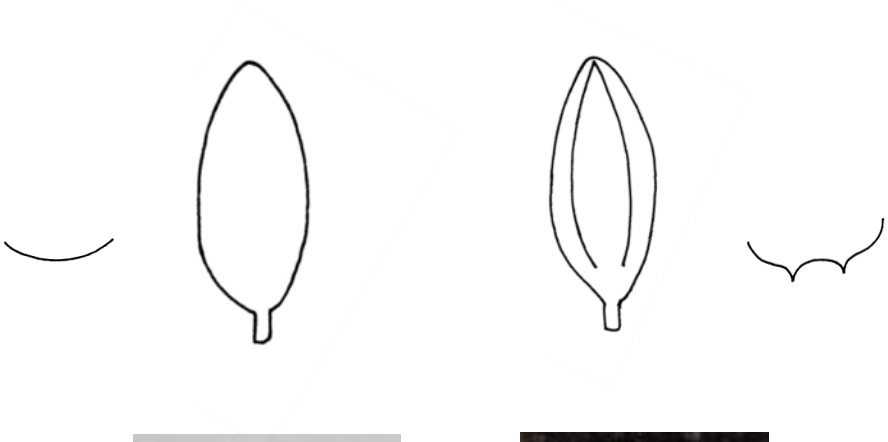
Yellow (3)



Orange (5)

Characteristic 32. Ray floret: upper surface

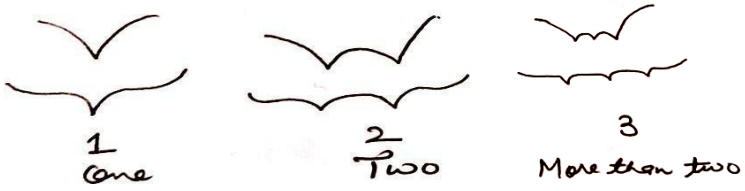
As seen from above (top view)



Smooth(3) **Keeled(5)**

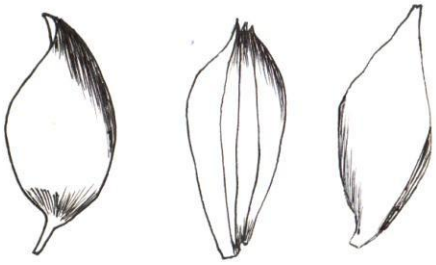
Characteristic 33. Ray Floret: Number of keels

As seen in backside of ray floret



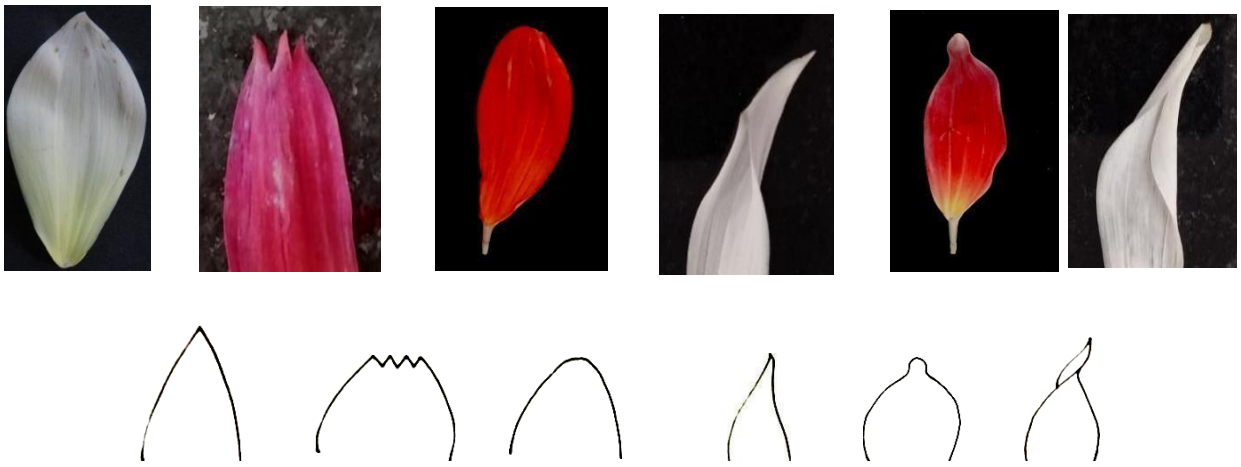
One(3) **Two (5)** **More than two(7)**

Characteristic 34. Ray Floret: Rolling of Margin



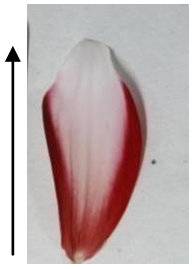
		
Involute(3)	**Flat(5)**	**Revolute(7)**

Characteristic 36. Ray Floret: Shape of Apex

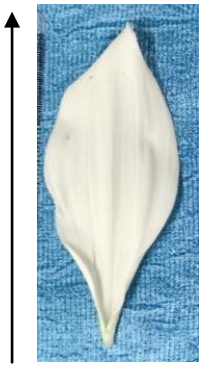


Pointed(1) Dentate(2) Rounded(3) Tapering(4) Dome shaped(5) Twisted(6)

Characteristic 37. Length of ray florets



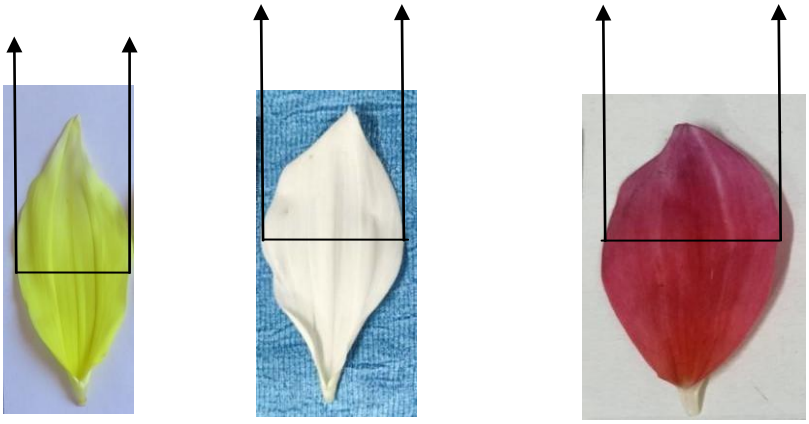
Short (3)



Medium(5)

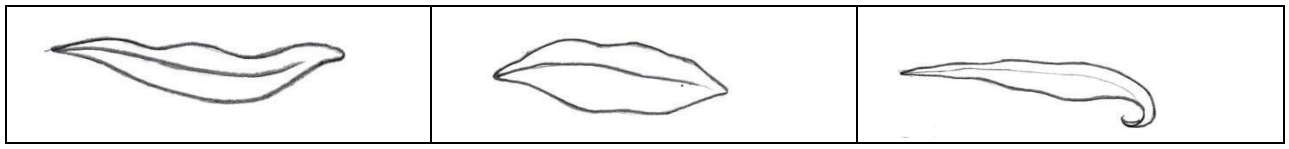
Long(7)

Characteristic 38. Width of ray florets



Narrow (3) **Medium(5)** **Broad(7)**

Characteristic 39: Ray floret: Longitudinal axis



Incurving(3) **Straight(5)** **Reflexing(7)**

Characteristic 40. Ray Floret: Number of Colours

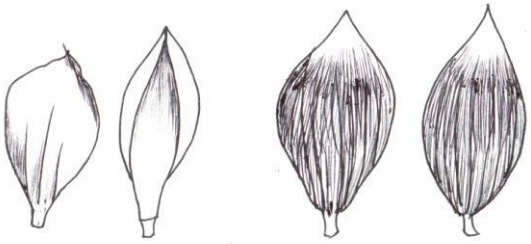
Flower colours are white, off-white, yellow, bronze, orange, orange red, salmon, pink, red, red purple, purple, violet

Single(3)

Bicoloured (5)

Multicoloured(7)

Characteristic 41. Ray Floret: Colour of lower surface

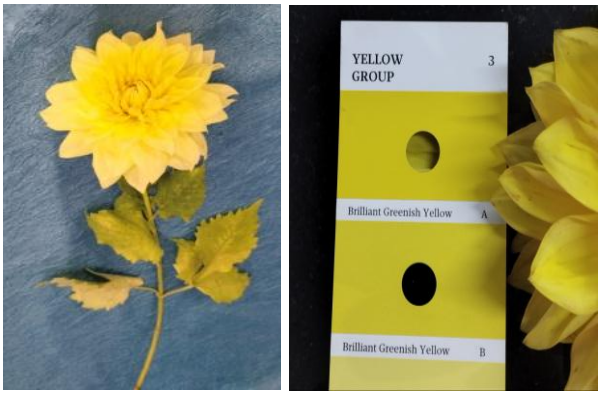


Same(1)

Different(9)

Characteristic 42 Flower Colour

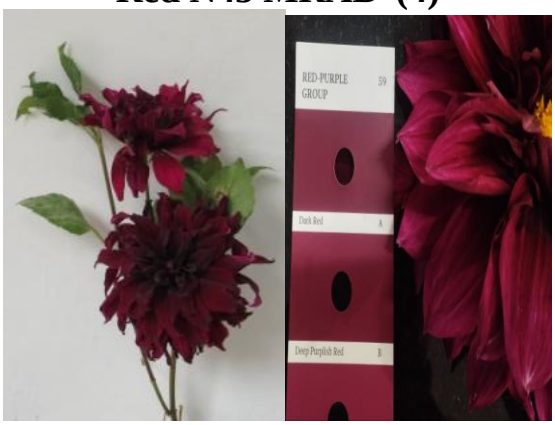
White 155 GWC (1)



Yellow 3BGYA (2)

Orange 25SOB (3)

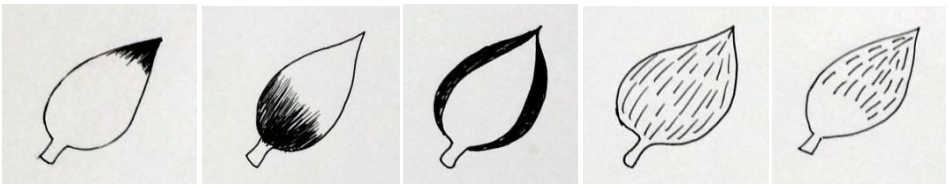
Red N45 MRAB (4)



Red Purple 59DRA (5)

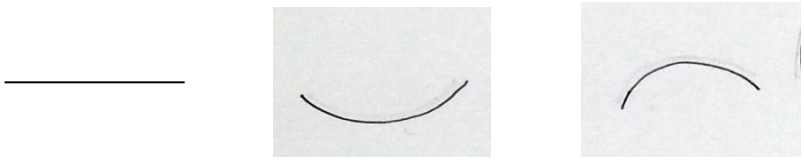
Purple NN 78SRPA (6)

Characteristic 43: Distribution of second colour of ray florets



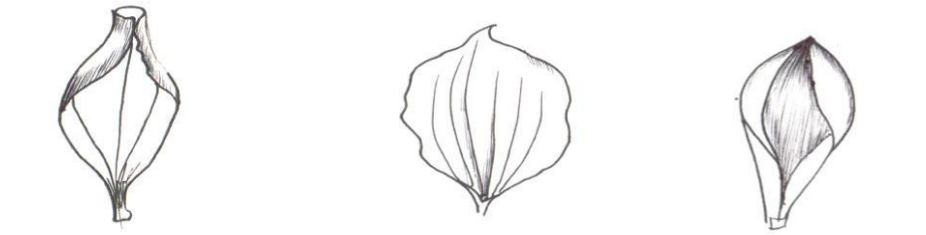
			 
At Tips(1)	**At base(2)**	**At margins(3)**	**Blended colours(4)**

Characteristic 44: Ray floret: profile in cross section at mid point



Flat (3) **Concave(5)** **Convex(7)**

Characteristic 45: Ray floret: Position of Twisting

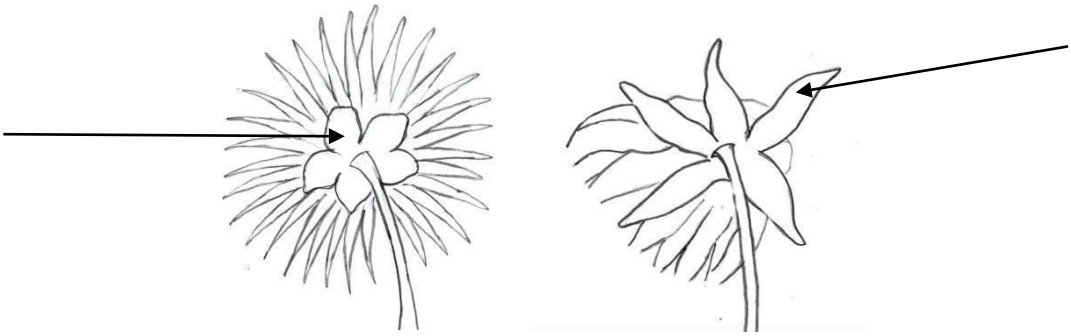


Apical(3) **Middle(5)** **Basal (7)**

Characteristic 46: Anthocyanin on Epicalyx

Absent (1) **Present(9)**

Characteristic 47: Shape of Epicalyx



Rounded (3)

Elongated(7)

Characteristic 51: Shape of Tuber

Rounded (1) **Elongated(9)**

Working group details:

The members of Task Force Committee

Sr. No.	Name	Address	Position
1.	Dr T. Janakiram, Vice Chancellor	Dr YSR Horticultural University Venkataramanaagudem, West Godavari District-534101 (Andhra Pradesh)	Chairman
2.	Dr P. Naveen Kumar, Principal Scientist and HOD	Indian Institute of Horticultural Research, Bangaluru, Karnataka	Member
3.	Dr Anup Chandra, HOD	Department of Forest Botany division, Forest Research Institute, Dehradun	Member
4.	Dr Tapas Chowdhary, Associate Scientist	BCKV, Kalyani, West Bengal	Member
5	Dr Priyanka Thakur, Principal Floriculturist	RHRTS, Dhaulakuan, District Sirmour (HP)	PI of DUS Project
6	Dr R. Sadhukhan, Professor and Head	BCKV, Kalyani, West Bengal	CO-PI DUS Project
7	Sh. U.K. Dubey Deputy Registrar	PPVFR Authority, New Delhi	Member Secretary

IX.DUS Testing Centres:

Nodal Centre	Co-nodal Centre
Dr Priyanka Thakur, Principal Floriculturist, RHRTS, Dhaulakuan, District Sirmour (HP).	Dr R. Sadhukhan, Professor and Head, BCKV, Kalyani, West Bengal.