

**Guidelines
for the Conduct of Test for
Distinctiveness, Uniformity and Stability
On**

Cherry
(*Prunus avium* L.)



Protection of Plant varieties and Farmer's Rights Authority

**(PPV & FRA)
Government of India**

Cherry (*Prunus avium* L.)

I. Subject

These test guidelines shall apply to all varieties of Cherry (*Prunus avium* L.)

II. Material required

1. The Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA) shall decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered for registration under the Protection of Plant Varieties and Farmers' Rights (PPV&FRA) Act, 2001. Applicants submitting such plant material from a country other than India shall make sure that all customs and quarantine requirements stipulated under relevant national legislations and regulations are complied with. As a minimum the applicant may submit 10 grafted or budded plants of apricot on rootstock for each centre.
2. The plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
3. The plant material should not have undergone any treatment, which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of tests

1. The minimum duration of the DUS tests shall normally be at least for two fruiting season in succeeded years.
2. The test should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for conduct of the evaluation. Each test should include total of 6 trees. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing seasons.

Test plot design

The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle. The additional test protocol for special purpose may be established by PPV & FRA

- 1 Locations : Two
- 2 No. of replication : Three
- 3 Treatment unit : Two tree per replication (total 6 plants/location)
- 4 Spacing : 2 x 2m

IV. Methods and observations

The characteristics described in the Table of characteristics (see section VII) shall be used for the testing varieties and hybrid for their DUS.

1. For the assessment of Distinctiveness and Stability observations shall be made on 6 plants or 18 parts taken from 6 plants with the exception of the observation on fruit which should be made on at least 20 fruits. In the case of parts of plants, the number to be taken from each of the plant should be three.
2. For the assessment of uniformity a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 6 plants, the maximum number of off-types allowed would be 1.
3. All observations on the tree and the branches should be made during dormancy.
4. Time of bloom should be recorded from first January to 75% bloom.
5. All observations on the leaf should be made on fully developed leaves of the middle third of current season's shoot.
6. Time of maturity should be recorded from 75% blooming to harvest.
7. Observations on the mature fruit should be recorded when fruit is ready for harvest.
8. Type of assessment of characteristics as indicated in column of Table VII of characteristics is as follows.

- a) *MG: Measurement by a single observation of a group of plants or parts of plants*
- b) *MS: Measurement by a single observation of individual plants or parts of plant*
- c) *VG: Visual assessments by a single observation of a group of plants or part of plants*
- d) *VS: Visual assessments by observation of individual plants or parts of plant*

V. Grouping of varieties

1. The candidate varieties for DUS testing shall be divided into groups to facilitate the assessment of Distinctiveness. Characteristics, which are known from experience not to vary, or to vary only slightly within a variety and which in their various states are fairly evenly distributed across all varieties in the collection are suitable for grouping purpose.
2. It is recommended that the competent authorities use the following characteristics for grouping varieties

The following characteristics are to be used for grouping cherry varieties as

- a. Tree growth habit
- b. Leaf shape
- c. Days to full bloom
- d. Days to maturity
- e. Fruit shape
- f. Stone shape

VI. Characteristics and symbols

1. To assess Distinctiveness, Uniformity and Stability, the characteristics and their states as given in the Table of characteristics (Section VII) shall be used.
2. Notes (1 to 9) shall be given for each state of expression for different characteristics for the purpose of electronic data processing.
3. Legend
 - (*) Characteristics that shall be observed during every growing season on all varieties and shall always be included in the description of the variety, except when the state of expression of any of these characters is rendered impossible by a preceding phenological characteristics or by the environmental conditions of the testing region. Under such exceptional situation, adequate explanation shall be provided.
 - (+) See Explanation on the Table of characteristics in Section VIII. It is to be noted that for certain characteristics, the plant parts on which observations to be taken are given in the explanation or figure(s) for clarity and not the colour variation.
4. A code number in the sixth column of Table of characteristics indicates the optimum stage for the observation of each characteristic during growth and development of plant. The relevant growth stages corresponding to these code numbers are described below:
 - a. Observations on tree vigour and habit should be made at the central third of the shoot during dormant season of adult trees relative to reference cultivars grafted on sweet seedling root stock.
 - b. The observations on the leaves should be made on mature leaves from current season's shoot.
 - c. Observations on flowers should be made at the time of full bloom (75% flowering)
 - d. Observation on fruit should be made at mature fruit
 - e. Observation on stone should be made after harvest of fruit

VII. Table of characteristics

S. No.	Characteristics	Status	Notes	Example varieties	Stage of observations	Type of assessment
1	2	3	4	5	6	7
1. (+) (*)	Tree: habit	Upright	1	Lapins, Sweet Heart, Bing, Bigarrean Noir Grosso, Guigne Noir Hative	a	VG
		Semi-upright	3	Stella, Van, Guigne Pour Pere Precoca, Bigarrean Napoleon, Lambert		
		Spreading	5	-		
2.	Tree: vigour	Weak	1	Stella , Van	a	VG
		Medium	3	Guigne Pour Pere Precoca, Bigarrean Napoleon, Lambert, Lapins, Sweet Heart, Bing, Bigarrean Noir Grosso, Guigne Noir Hative		
		Strong	5	-		
3. (+)	One-year-old shoot: length of internode (mm)	Short (< 30)	3	Lapins, Sweet Heart, Bing, Guigne Noir Hative, Stella, Guigne Pour Pere Precoca, Bigarrean Napoleon, Lambert	a	MG
		Medium (30-40)	5	Van, Bigarrean Noir Grosso		
		Long (> 40)	7	-		
4.	Leaf blade: length (cm)	Short (< 15)	3	Guigne Pour Pere Precoca, Van, Bing	b	MG
		Medium (15-20)	5	Stella, Bigarrean Noir Grosso, Guigne Noir Hative		
		Long (> 20)	7	Sweet Heart, Lapins, Lambert		
5.	Leaf blade: width (cm)	Narrow (< 5)	3	-	b	MG
		Medium (5-10)	5	Guigne Pour Pere Precoca, Van, Bing, Sweet Heart, Guigne Noir Hative, Lapins, Lambert		
		Broad (> 10)	7	Bigarrean Napoleon, Stella, Bigarrean Noir Grosso		
6.	Leaf blade: ratio length/width	Small (< 1.5))	3	-	b	MG
		Medium (1.5-3.0)	5	Guigne Pour Pere Precoca, Van, , Bing, Sweet Heart, Guigne Noir Hative, Lapins, Lambert,		

				Bigarrean Napoleon, Stella, Bigarrean Noir Grosso		
		Large (>3.0)	7	-		
7. (+)	Leaf: shape	Obovate	3	Bigarrean Napoleon, Lapins, Bing	b	VG
		Lanceolate	5	Guigne Pour Pere Precoca, Van, Stella, Bigarrean Noir Grosso, Guigne Noir Hative, Sweet Heart, Lambert		
8. (+) (* (*))	Leaf blade: angle of apex (excluding tip)	Acute	3	Guigne Pour Pere Precoca, Van, Stella, Bigarrean Noir Grosso, Guigne Noir Hative, Sweet Heart, Lambert	b	VG
		Right-angled	5	Bigarrean Napoleon, Lapins, Bing		
9. (+) (* (*))	Leaf blade: shape of base	Acute	3	Guigne Pour Pere Precoca, Lapins, Bing, Bigarrean Napoleon	b	VG
		Obtuse	5	Van, Stella, Sweet Heart, Guigne Noir Hative, Bigarrean Noir Grosso, Lambert		
10.	Leaf: length of petiole (cm)	Short (< 3)	3	-	b	MG
		Medium (3-6)	5	Guigne Pour Pere Precoca, Van, Bing, Stella, Bigarrean Noir Grosso, Bigarrean Napoleon, Guigne Noir Hative, Sweet Heart, Lapins, Lambert		
		Long (> 6)	7	-		
11.	Flower: duration of blooming (Days)	Early (>95)	3	Bigarrean Napoleon	c	VG
		Mid-season (95 to 100)	5	Guigne Pour Pere Precoca, Van, Bing, Stella, Bigarrean Noir Grosso, Sweet Heart, Lapins, Lambert		
		Late (.100)	7	Guigne Noir Hative		
12. (+)	Flower: arrangement of petals	Free	3	Bing, Lapins, Van	c	VG
		Intermediate	5	Bigarrean Napoleon, Lambert, Guigne Noir Hative, Sweet Heart		
		Overlapping	7	Bigarrean Noir Grosso, Guigne Pour Pere Precoca, Stella		
13.	Fruit :harvest maturity (Days)	Early (<55)	3	Sweet Heart, Bing, Guigne Pour Pere Precoca, Lambert	d	MG

		Mid (55-60)	5	Lapins, Bigarreau Noir Grosso, Stella, Bigarreau Napoleon, Van		
		Late (>60)	7	Guigne Noir Hative		
14.	Fruit : weight (g)	Small (< 4)	3	Guigne Pour Pere Precoca	d	MG
		Medium (4-6)	5	Van, Stella, Lapins, Bigarreau Noir Grosso, Guigne Noir Hative, Lambert, Sweet Heart, Bigarreau Napoleon, Bing		
		Large (> 6)	7	-		
15. (+)	Fruit: height (mm)	Short (< 15)	3	Guigne Pour Pere Precoca	d	MG
		Medium (15-20)	5	Stella		
		Tall (> 20)	7	Van, Lambert, Bigarreau Napoleon, Guigne Noir Hative, Lapins, Bigarreau Noir Grosso, Sweet Heart, Bing		
16. (+)	Fruit: width (mm)	Narrow (< 15))	3	Van, Guigne Pour Pere Precoca, Stella	d	MG
		Medium (15-20)	5	Bigarreau Napoleon, Bigarreau Noir Grosso, Lapins, Guigne Noir Hative, Lambert, Sweet Heart, Bing		
		Broad (> 20)	7	-		
17. (+) (*)	Fruit: shape	Round	3	Guigne Pour Pere Precoca, Lapins, Stella	d	VG
		Elliptic	5	Sweet Heart		
		Oblate	7	Van, Bing, Bigarreau Noir Grosso, Lambert		
		Reniform	9	Bigarreau Napoleon		
18. (+) (*)	Fruit: pistil end	Pointed	3	Bing	d	VG
		Flat	5	Guigne Pour Pere Precoca, Bigarreau Napoleon, Lapins, Stella, Sweet Heart, Van, Bigarreau Noir Grosso		
		Depressed	7	Lambert		
19.	Fruit: skin colour	Yellow with red blush	3	Bigarreau Noir Grosso		VG
		Light red	5	Bigarreau Napoleon		
		Red	7	Sweet Heart, Guigne Noir Hative, Bing, Lambert, Lapins, Stella		
		Dark red	9	Van, Guigne Pour Pere Precoca		
20.	Fruit: flesh	Creamy	1	Lambert	d	VG

	colour	Yellow	2	Bigarreau Noir Grosse, Bigarreau Napoléon		
		Light-red	3	Sweet Heart, Guigne Noir Hative, Lapins, Bing, Stella		
		Red	4	Van, Guigne Pour Pere Precoca		
21.	Fruit: sweetness (°Brix)	Low (< 12)	1	Lapins, Bigarreau Napoléon, Lambert, Guigne Pour Pere Precoca, Stella, Bigarreau Noir Grosse, Bing, Guigne Noir Hative, Sweet Heart	d	MG
		Medium (12-16)	2	Van		
		High (> 16)	3	-		
22.	Fruit: firmness of flesh	Soft	3	Bigarreau Napoléon, Lapins, Sweet Heart	d	VG
		Intermediate	5	Guigne Pour Pere Precoca, Lambert, Van, Bing, Bigarreau Noir Grosse, Stella, Guigne Noir Hative		
		Hard	7	-		
23. (+)	Fruit: length of fruit stalk (mm)	Short (< 45)	3	Lambert, Lapins	d	MG
		Medium (45-55 mm)	5	Stella		
		Long (> 55)	7	Guigne Pour Pere Precoca, Bigarreau Napoléon, Bigarreau Noir Grosse, Guigne Noir Hative, Bing, Van, Sweet Heart		
24.	Stone : weight (g)	Small (< 0.3)	3	Van, Guigne Noir Hative	e	MG
		medium (0.3-0.6)	5	Sweet heart, Bigarreau Noir Grosse, Stella, Lambert, Bing, Lapins		
		Large (> 0.6)	7	Bigarreau Napoléon, Guigne Pour Pere Precoca		
25. (+) (*)	Stone: shape	Slightly elliptic	1	Van, Bing, Lapins, Bigarreau Noir Grosse, Guigne Noir Hative, Bigarreau Napoléon	e	VG
		Elliptic	2	Guigne Pour Pere Precoca, Stella, Sweet Heart		
		Round	3	Lambert		

VIII. Explanation for the Table of characteristics

Characteristics 1: Tree: habit



Upright
(1)



Semi-upright
(3)

Characteristics 3: one year old shoot: length of internode



Short
(3)



Medium
(5)

Characteristics 7: Leaf: shape

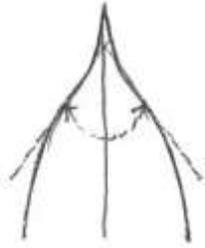


Obovate
(3)

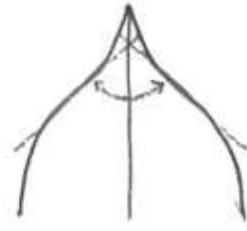


Lanceolate
(5)

Characteristics 8: Leaf blade: angle of apex (excluding tip)



Acute
(3)



Right-angled
(5)

Characteristics 9: Leaf blade: shape of base



Acute
(3)



Obtuse
(5)

Characteristics 12: Flower: arrangement of petals



Free
(3)

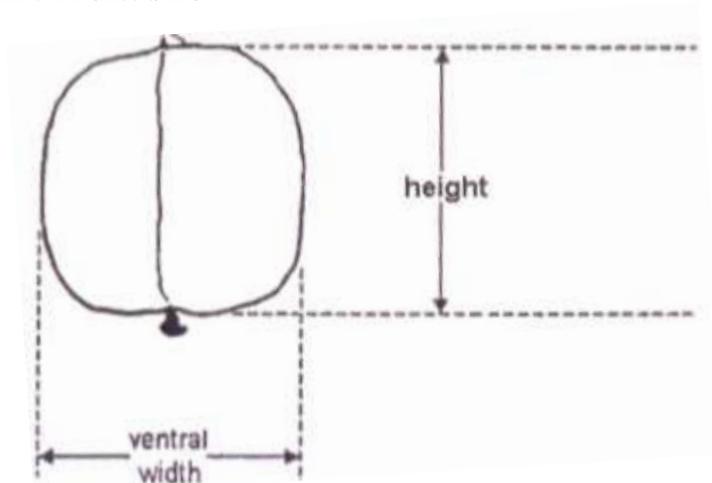


Medium
(5)



Overlap
(7)

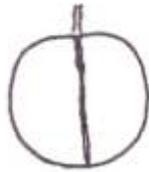
Characteristics 14 & 15: Fruit: size



Characteristics 16: Fruit: shape



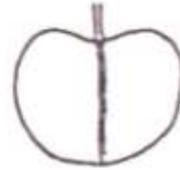
Round
(3)



Elliptic
(5)

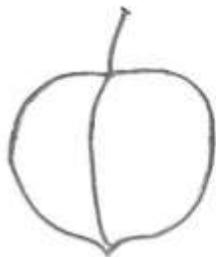


Oblate
(7)



Reniform
(9)

Characteristics 17: Fruit: pistil end



Pointed
(3)



Flat
(5)



Depressed
(7)

Characteristics 22: Fruit: length of fruit stalk



Long
(3)



Medium
(7)



Short
(5)

Characteristics 24: Stone: shape



Slightly elliptic
(1)



Elliptic
(2)



Round
(3)

Working Group details:

The Test Guidelines were developed by Nodal Officer Dr. Dinesh Kumar, Co-Nodal officer Dr. K.K.Srivastava, Research associate Tanveer Ahmad Dar of Central Institute of Temperate Horticulture, Srinagar, J&K. (ICAR) and Dr. Tejbir Singh, Registrar, PPV&FRA New Delhi. The suggestions and technical inputs provided by following task force (4/2012) Constituted by the PPV&FR Authority in the development and finalization of this DUS test guidelines.

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