

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

Apricot
(*Prunus armeniaca* L.)



**Protection of Plant varieties and Farmer's Rights Authority
(PPV & FRA)
Government of India**

Apricot (*Prunus armeniaca* L.)

I. Subject

These test guidelines shall apply to all varieties of Apricot (*Prunus armeniaca* 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 and kernel should be made after harvest of fruit

VII. Table of characteristics

S. No.	Characteristics	Status	Notes	Example varieties	Stage of observations	Type of assessment
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1	2	3	4	5	6	7
1. (+) (*)	Tree: habit	Upright	3	Tokpopa Nimu	a	VG
		Spreading	5	Rival, Heartly, Afghani, Communis, Turkey, New Castle, Viva Gold, Balcota, Erani, Chinese, Tilton, Communis Holly, Fairmedcester, Australian, Nari,		
		Drooping	7	-		
2.	Tree: vigour	Weak	3	-	a	VG
		Medium	5	Harcot, Balcota, Erani, Chinese, Tilton, Afghani, Communis Apricot, Communis Holly, Australian, Nari, New Castle, Viva Gold		
		Strong	7	Rival, Tokpopa Nimu, Fairmedcester		
3.	Leaf: area (cm²)	Extremely small (< 30)	1	Tilton	b	MG
		Small (31-40)	3	Fairmedcester, Rival, Afghani, Viva Gold, New Castle, Heartly, Communis		
		Medium (41-50)	5	Turkey, Harcot, Communis Holly, Balcota, Erani, Austrilian		
		Large (51-60)	7	Tokpopa Nimu		
		Extremely large (> 60)	9	Chinese, Nari		
4.	Leaf blade: length (cm)	Short (< 7)	3	New Castle, Rival, Fairmedcester, Tilton, Communis Holly, Communis	b	MG
		Medium (7-9)	5	Turkey, Viva Gold, Harcot, Balcota, Heartly, Australian, Afghani, Erani, Tokpopa Nimu		
		Long (>9)	7	Chinese		
5.	Leaf blade:width (cm)	Narrow (< 6)	3	Fairmedcester, Communis Holly, Heartly, New Castle, Rival, Tilton	b	MG
		Medium (6-8)	5	Turkey, Viva Gold, Harcot, Balcota, Afghani, Erani, Communis, Australian, Tokpopa Nimu, Nari		
		Broad (> 8)	7	Chinese		
6.	Leaf blade: ratio length/width	Small (< 1)	3	Communis, Rival, Australian	b	MG
		Medium (1-2)	5	Harcot, Tilton, Communis Holly		
		Large (> 2)	7	Nari, Heartly		
7. (+) (*)	Leaf blade: shape of base	Obtuse	2	Heartly, Harcot, Afghani, Communis Holly, Viva Gold	b	VG
		Truncate	3	Tokpopa Nimu, Balcota, Erani,		

				Turkey, Australian, Nari		
		Cordate	4	New Castle, Rival, Tilton, Communis, Chinese, Fairmedcester		
8. (+) (* (*	Leaf blade: angle of apex (excluding tip)	Right-angled	3	Tokpopa Nimu, Afghani, Viva Gold	b	VG
		Moderately obtuse	5	New Castle, Heartly, Harcot, Balcota, Erani, Tilton, Communis Holly, Fairmedcester		
		Strongly obtuse	7	Chinese, Rival, Communis, Turkey, Australian, Nari		
9. (+) (* (*	Leaf blade: incisions of margin	Crenate	3	Afghani, Communis Holly, Tokpopa Nimu, Viva Gold	b	VG
		Serrate	5	Chinese, Heartly		
		Biserrate	7	Balcota, Communis, Erani, Fairmedcester, Harcot, Australian, Turkey, Nari, New Castle, Rival, Tilton		
10.	Petiole: length (cm)	Short (< 3)	3	Tilton, Communis, Turkey, New Castle, Rival	b	MG
		Medium (3-4)	5	Erani, Balcota, Harcot, Australian, Communis Holly, Heartly, Nari, Viva Gold, Fairmedcester, Tokpopa Nimu, Afghani		
		Long (> 4)	7	Chinese		
11.	Petiole: glands number	< 2	3	Tokpopa Nimu	b	VG
		2-4	5	Harcot, Australian, Nari, Fairmedcester, Tilton, Communis, Rival, Communis Holly, Heartly, Viva Gold, New Castle		
		> 4	7	Chinese, Erani, Balcota, Afghani, Turkey		
12.	Petiole: anthocyanin coloration of upper side	Weak	3	Balcota, Afghani, Erani, Tokpopa Nimu	b	VG
		Medium	5	New Castle, Communis, Viva Gold, Australian		
		Strong	7	Rival, Fairmedcester, Tilton, Communis Holly, Turkey, Harcot, Heartly, Chinese, Nari		
13.	Flowering: Duration of blooming (days)	Early (< 75)	3	New Castle, Harcot	c	MG
		Mid season (75-80)	5	Communis Holly, Balcota, Chinese, Rival, Heartly, Fairmedcester, Viva Gold, Turkey, Afghani, Tilton, Erani, Communis, Nari, Australian		
		Late (> 80)	7	Tokpopa Nimu		
14.	Flower : diameter (mm)	Small (< 30)	3	Viva Gold	c	MG
		Medium		Communis Holly, Tokpopa Nimu, Balcota, Chinese, Rival, Heartly,		

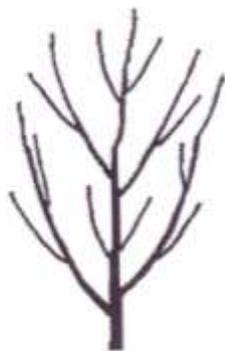
		(30-35)		Harcot, Turkey, Afghani, Tilton, Erani, New Castle, Communis, Nari		
		Large (> 35)		Fairmedcester, Australian		
15.	Fruit: harvest maturity (days)	Early (< 100)	2	Turkey, New Castle	d	MG
		Mid (100-115)		Erani, Heartly		
		Late (> 115)		Communis Holly, Tokpopa Nimu, Balcota, Chinese, Rival, Harcot, Fairmedcester, Viva Gold, Turkey, Afghani, Tilton, Communis, Nari, Australian		
		Medium (30-35)	5	Communis Holly, Tokpopa Nimu, Balcota, Chinese, Rival, Heartly, Harcot, Turkey, Afghani, Tilton, Erani, New Castle, Communis, Nari		
		Large (> 35)	7	Fairmedcester, Australian		
16. (+)	Fruit size: weight (g)	Small (< 40)	3	New Castle, Viva Gold, Afghani, Communis Holly Balcota, Nari, Turkey	d	MG
		Medium (40-60)	5	Chinese, Erani, Communis		
		Large (> 60)	7	Harcot		
17.	Fruit: length (mm)	Short (< 30)	3	Afghani, New Castle, Fairmedcester, Heartly, Tilton	d	MG
		Medium (30-40)	5	Balcota, Turkey, Nari, Australian, Viva Gold, Erani, Communis, Chinese, Communis Holly, Tokpopa Nimu, Rival		
		Tall (> 40)	7	Harcot		
18.	Fruit: width (mm)	Narrow (< 40)	3	Afghani, Heartly, Fairmedcester, Tilton	d	MG
		Medium (30-40)	5	New Castle, Balcota, Tokpopa Nimu, Harcot, Viva Gold, Rival, Turkey, Australian, Nari		
		Broad (> 40)	7	Chinese, Communis, Erani		
19. (+) (*)	Fruit: shape	Round	1	Australian, Turkey, Nari, Fairmedcester, Afghani, Communis, Erani, Balcota	d	VG
		Elliptic	3	Harcot, Chinese		
		Ovate	5	Heartly, Viva Gold		
		Oblong	7	Communis Holly, Tilton, Rival		
20.	Fruit :ratio weight of pulp / weight of stone	Small (< 10)	3	Tilton, Fairmedcester, Heartly, Balcota, New Castle, Communis Holly, Chinese, Turkey, Erani, Viva Gold, Rival, Australian, Nari	d	MG

		Medium (10-20)	5	Harcot, Communis, Afghani, Tokpopa Nimu		
		Large (> 20)	7	-		
21.	Fruit : cavity depth (mm)	Shallow (< 10))	3	Balcota, Communis, Communis Holly, Fairmedcester, Harcot, Heartly, Tilton, Turkey, Viva Gold	d	VG
		Intermediate (10-15)	5	Afghani, Chinese, Nari, New Csatle, Rival, Tokpopa Nimu		
		Deep (> 15)	7	Erani		
22.	Fruit :suture	Shallow	3	Rival, Viva Gold, Communis, Communis Holly	d	VG
		Intermediate	5	Erani, Balcota, Tilton, Tokpopa Nimu, Fairmedcester, Australian, Heartly, Harcot, Nari		
		Deep	7	New Castle, Turkey, Chinese, Afghani		
23.	Fruit: symmetry along the suture	Asymmetrical	1	-	d	VG
		Symmetrical	5	Communis Holly, Tokpopa Nimu, Balcota, Chinese, Rival, Heartly, Harcot, Fairmedcester, Viva Gold, Turkey, Afghani, Tilton, Erani, New Castle, Communis, Nari, Australian		
24. (+) (*)	Fruit: shape of apex	Flat	3	New Castle, Harcot, Tilton	d	VG
		Round	5	Communis Holly, Tokpopa Nimu, Balcota, Chinese, Rival, Heartly, Turkey, Afghani, Erani, Communis, Nari, Australian		
		Pointed	7	Fairmedcester		
25.	Fruit: ground colour of skin	Greenish yellow	1	Afghani, Tokpopa Nimu, Australian, Communis	d	VG
		Yellow	3	New Castle, Turkey, Erani, Harcot, Balcota		
		Light orange	5	Tilton, Viva Gold		
		Orange	7	Rival, Chinese, Turkey, Nari		
		Red blush	9	Fairmedcester, Heartly		
26.	Fruit : firmness of flesh	Soft	3	Turkey, Balcota, Australian	d	VG
		Medium	5	New Castle, Erani, Harcot, Rival, Communis Holly, Chinese, Afghani, Tilton, Tokpopa Nimu, Nari		
		Hard	7	Viva Gold, Fairmedcester, Communis, Heartly		
27.	Fruit: flesh juiciness	Less juicy	3	Erani, Heartly	d	VG
		Intermediate	5	Communis Holly, New Castle, Harcot, Balcota, Afghani, Tilton, Tokpopa Nimu, Viva Gold, Fairmedcester, Australian		

		Juicy	7	Turkey, Rival, Chinese, Communis, Nari		
28.	Stone: weight (g)	Small (< 3)	5	Turkey, Tilton, Rival, Nari, Fairmedcester, Communis	e	MG
		Medium (3-4)	8	Harcot, Communis Holly, Chinese		
		Large (> 4)	9	Balcota		
29. (+) (*)	Stone: shape	Round	3	Erani, Nari, New Castle, Communis, Australian, Balcota	e	VG
		Ovate	5	Tokpopa Nimu, Viva Gold, Communis Holly, Fairmedcester		
		Elliptic	7	Harcot, Rival, Chinese, Afghani, Heartly		
		Elongated	9	Tilton		
30.	Seperation of stone	Semi-clinging	5	Rival, Erani, New Castle	e	VG
		Free	7	Communis Holly, Tokpopa Nimu, Balcota, Chinese, Heartly, Harcot, Fairmedcester, Viva Gold, Turkey, Afghani, Tilton, Communis, Nari, Australian		
31.	Stone: colour	Brown	3	Communis Holly, Tokpopa Nimu, Balcota, Chinese, Heartly, Harcot, Fairmedcester, Viva Gold, Turkey, Afghani, Tilton, Communis, Nari, Australian, Rival, Erani, New Castle	e	VG
		Creamy	5	CITH-AP-20		
32.	Kernel taste	Bitter	3	Heartly, Erani, Balcota, Harcot, Chinese, Tokpopa Nimu, Afghani, Communis Holly, Australian	e	VG
		Sweet	5	Tilton, New Castle, Turkey, Rival, Nari, Tilton, Fairmedcester, Viva Gold, Communis		
33.	Kernel: weight (g)	Small (< 0.5)	3	Tilton,	e	MG
		Medium (0.5-1.0)	5	Nari, Afghani, Harcot, Fairmedcester, Heartly, Turkey, New Castle, Communis		
		Large (> 1.0)	7	Tokpopa Nimu, Chinese, Erani, Communis Holly, Rival, Viva Gold, Australian, Balcota		

VIII. Table of characteristics

Characteristics 1: Tree: habit



Upright
(3)



Spreading
(5)

Characteristics 7: leaf blade: Shape of base



Obtuse
(2)

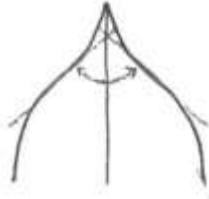


Truncate
(3)

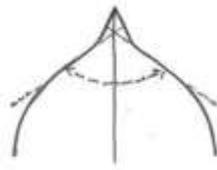


Cordate
(4)

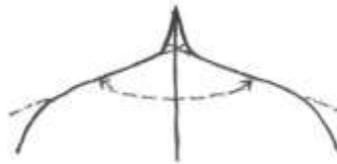
Characteristics 8: leaf blade: angle of apex (excluding tip)



Right-angled
(3)



Moderately obtuse
(5)

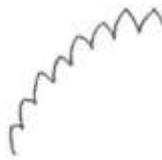


Strongly obtuse
(7)

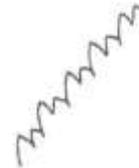
Characteristics 9: Leaf blade: incisions of margin



Crenate
(3)

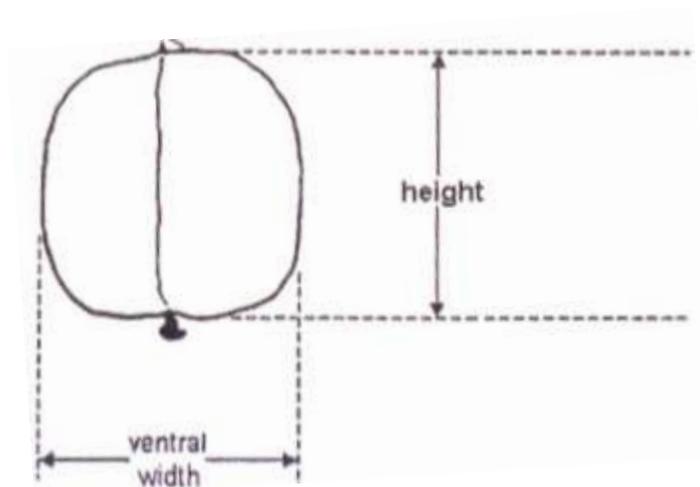


Serrate
(5)

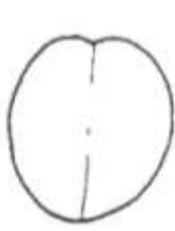


Biserrate
(7)

Characteristics 15 & 16: Fruit: size



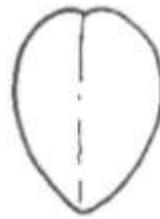
Characteristics 17: Fruit: shape



Round
(1)



Elliptic
(3)



Ovate
(5)



Oblong
(7)

Characteristics 22: Fruit: shape of apex



Flat
(3)

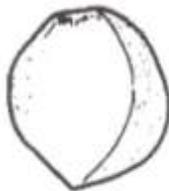


Round
(5)



Pointed
(7)

Characteristics 27: Stone: shape



Round
(3)



Ovate
(5)



Elliptic
(7)



Elongated
(9)

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.

The Members of the Task Force (4/2012)

Shri K.K. Jindal, Ex.ADG and Emeritus Scientist, Department of Fruit Science, Dr. YSPUH&F, Nauni, Solan-173230 (H.P.).	:	Chairman
Dr. M.C. Nautiyal, Ex. Dean, GBPUAT, Doon Enclave, Nakraunda Road, Harrawala Dhera Doon-248001.	:	Member
Dr. M.S. Mankotia, Professor (Horticulture), Regional Horticultural Research Station, Dr. YSPUH&F, Nauni, Solan-173230 (H.P.).	:	Member
Dr. D.R. Gautam, Ex. Director Extension Education, Dr.YSPUH&F, Dass Niwas, Near JBT School Officer Colony P.O. Galanagolan Town-173212. (H.P.).	:	Member
Dr. Nazeer Ahmed Director, Central Institute of Temperate Horticulture, Rangreth, Srinagar-190007 (J&K).	:	Member
Dr. K.K. Srivastava, Senior Scientist, Central Institute of Temperate Horticulture, Rangreth, Srinagar-190007 (J&K).	:	Member
Dr. Manoj Srivastava, Registrar PPV&FR Authority, New Delhi.	:	Member Secretary

Nodal Person

Dr. Dinesh Kumar
Pr. Scientist, Central Institute of Temperate Horticulture, Srinagar, J&K.

Co-Nodal Person

Dr. K.K. Srivastava
Senior Scientist, Central Institute of Temperate Horticulture, Srinagar, J&K.

Special Invitees

Dr. B. S. Thakur,
Professor, Horticulture Department of Fruit Science and Breeding,
Dr. YSPUH&F, Nauni, Solan-173230 (H.P.).

Dr. A. A. Sofi,
Former Director, Central Institute of Temperate Horticulture,
Iqbal colony, Zaniakot, Srinagar-190012 (J&K).

Dr. Dinesh Kumar
Pr. Scientist, Central Institute of Temperate Horticulture, Srinagar, J&K.

Nodal DUS Test Centre	Other DUS Test Centre
Central Institute of Temperate Horticulture, Rangreth, Srinagar (J&K)	---