

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

Apple

(*Malus domestica* Borkh)



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

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Apple (*Malus domestica* Borkh)

I. Subject:

These test guidelines shall be applicable for all cultivars/ varieties of apple (*Malus domestica*).

II. Material required

- 1 The Protection of Plant Varieties and Farmers Rights Authority shall decide on the quantity and quality of planting material required for DUS testing of the candidate variety/ varieties when and where to be delivered for registration under the Protection of Plant Varieties and Farmers Rights. (PPV & FRA) Act, 2001. Applicant submitting such plant material for 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 need to submit 06 grafted or budded plants of pear on M-9 root stock for each centre.
- 2 The planting material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or diseases.
- 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 two fruiting seasons in different years. Tests shall be conducted at least at two places.
2. The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. 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 addition test protocol for special purpose if any may be established by PPV & FRA.

1. Locations : Two
2. No. of replications : Three
3. Treatment unit : Two trees per replication (total 6 plants /location)
4. Spacing : 2.5 x 2.5m
- 5.

IV. Methods and observations

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

1. For the assessment of Distinctiveness and Stability observation shall be made on 6 plants or parts taken from each of 6 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

2. Mature leaves in the middle third of the youngest shoots not showing signs of active growth should be selected for the observations on the leaf.
 3. Observations on the flowers should be made at the time of full bloom.
 4. Observations on the mature fruit should be recorded when fruit is ready for harvesting.
- 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 parts of plants*
 - d) *VS: Visual assessments by a single 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. The following characteristics are recommended for grouping of varieties.
 - a) Tree: type
 - b) Tree: habit
 - c) Fruit shape
 - d) Fruit: over color
 - e) Fruit: pattern of over color

VI. **Characteristics and symbols**

1. To assess Distinctiveness, Uniformity and Stability, the characteristics and their states as given in the Table of characteristics (Section VIII) shall be used.
 2. Notes (1-9) shall be given for each state of expression of characters 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 are 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.
- (+) Characteristics with plus (+) sign: 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 are 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- VIII of characteristics indicates the optimum stage for the observation of each characteristic during the growth and development of plant. The relevant growth stages corresponding to these code numbers are described below:

- a. Tree: Type and habit: Observation should be made on dormant stage.
- b. One year old shoot: Observations on one year old shoots should be made on lateral dormant shoot on the tree which have completed at least one growing season at the testing centre.
- c. Tree vigour, leaf, petiole:- Observations should be recorded when the tree is in peak vegetative growth. The observations on the leaf blade petiole should be recorded on fully developed leaves from the middle third of vigorous current season's shoots at the periphery
- d. Flower:- Observations on the flower should be made at the full bloom stage.
Type of flower bearing: Bearing pattern should be recorded at pink bud stage.
- f. Fruit: Observations on the fruits should be made on 10 randomly selected fruits taken from a minimum sample of 10 fruits after 15 days from fruit set for recording the anthocyanin colour and for fruit characters it should be taken at the time of maturity. The terminal fruits should not be taken for recording the observations except in terminal bearers.

VII- Explanations for Individual Characteristics

- 1. Tree vigour
The vigour of the tree should be considered as the overall abundance of vegetative growth.
- 2. Tree type
 - a) Columnar: a compact spur –type tree form with virtually no side branches. Closely spaced short fruiting spurs are produced along the main stem.
 - b) Ramified: form where trees have well developed branches.

VIII. Table of characteristics

| S. No. | Characteristics | States | Notes | Example variety | Stage of Observation | Type of assessment |
|-------------|--|------------------|-------|--|----------------------|--------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | |
| 1 | Tree: vigor | weak | 3 | Black Ben Davis, | a | VG |
| | | medium | 5 | Golden Delicious, Granny Smith, Spartan, Vista Bella, Cooper IV, Silver Spur, | | |
| | | strong | 7 | Benoni, Coe Red Fuji, Starkrimson, Mollies Delicious, American Apirouge, Firdous, Coe Red Fuji, | | |
| 2 * + | Tree: type | columnar | 1 | Spartan, Starkrimson, Red Chief, Top Red, Tydeman's Early Worcester, Well Spur, Mc Spur, | c | VG |
| | | ramified | 2 | Starking Delicious, Coe Red Fuji, Granny Smith, Vista Bella, Silver Spur, Golden Delicious, Gold Spur, | | |
| 3 * + | Tree: habit | upright | 3 | American Apirouge, Benoni, Pink lady, Laxton's Fortune, Lal Ambri, Ambri, | a | VG |
| | | spreading | 5 | Red Fuji, Coe Red Fuji, Granny Smith, Spartan, Vista Bella, Starkrimson, | | |
| | | drooping | 7 | ----- | | |
| 4 * + | Bearing habit | spurs only | 3 | Oregon Spur, Silver Spur, Tydeman's Early Worcester, Summerred, Red Baron, Green Sleeves | e | VG |
| | | Mixed | 5 | Starking Delicious, Golden Delicious | | |
| | | Terminal | 7 | Gold Spur, Red Chief | | |
| 5 | Shoot: colour on one year old, on sunny side | dark brown | 1 | Laxton's Fortune, Spartan, Starkrimson, Mollies Delicious, Red Fuji, Red Chief | b | VG |
| | | light brown | 2 | Tydeman's Early Worcester, Granny Smith, Cooper IV, Silver Spur, Firdous | | |
| | | medium brown | 3 | American Apirouge, Vance Delicious, | | |
| | | reddish brown | 4 | Golden Delicious, Vista Bella, Gold Spur, Summerred, Scarlet Gala, Michal, Red Baron, Skyline Supreme, Parkin's Beauty | | |
| 6 * + | Leaf blade: orientation in relation to shoot | upwards | 3 | Red Chief, Oregon Spur, Shireen, Royal Delicious, Laxton's Fortune | c | VG |
| | | outwards | 5 | Coe Red Fuji, Granny Smith, Spartan, Gala Mast, Starkrimson, Mollies Delicious, Cooper IV | | |
| | | downwards | 7 | Vista Bella, Coe Red Fuji, Gold Spur, Prima, Rome Beauty, Parkin's Beauty | | |
| 7 | Leaf blade: length (cm) | short (<4.0) | 1 | Mc-Spur, Starkrimson, Coe Red Fuji, Rich-a-Red, Starking Delicious, Anna, | c | MS |
| | | medium (4.0-7.0) | 3 | Coe Red Fuji, Granny Smith, Spartan, Cooper-IV, American Apirouge, | | |
| | | broad (>7.0) | 7 | Golden Delicious, Vista Bella, Mollies Delicious | | |

| | | | | | | |
|-----------------------------------|--|--|-------------------------------------|--|---|----|
| | | | | Tydemans Early Worcester, Laxton's Fortune , | | |
| 8 | Leaf blade: width (cm) | | | | | |
| | | narrow (2-4.0) | 3 | Tydemans Early Worcester, Breaburn | c | MS |
| | | medium(4.0-6.0) | 5 | Jona Gold, Granny Smith, Starkrimson, Cooper-IV, Silver Spur , Red Fuji, | | |
| | | broad(>6.0) | 7 | Vista Bella, Coe Red Fuji, Spartan, Golden Delicious, Starking Delicious, Red Gold , Tydemans Early Worcester, Pink Lady, | | |
| 9 * | Leaf blade : ratio length /width | | | | | |
| | | small (0.5-1.0) | 1 | Indo, Jonathan, | c | MS |
| | | medium(1.0-2.0) | 3 | Silver Spur , Coe Red Fuji, Gala Mast | | |
| | | large (2.0-3.0) | 5 | Cooper-IV, Golden Delicious | | |
| very large (>3.0) | 7 | Mollies Delicious , Vista Bella | | | | |
| 10 * | Leaf blade: pubescence on lower side | | | | | |
| | | less/ weak | 1 | Golden Delicious, Vista Bella | c | VG |
| | | moderate | 3 | Gala Mast , Starkrimson, Cooper IV | | |
| high | 5 | Red Chief , Jonathan, Red Chief | | | | |
| 11 | Leaf blade: intensity of green color | light green | 1 | Parkin's Beauty, Golden Delicious, Lemon Gourd | c | VG |
| | | green | 2 | Cooper IV, Red Spur, Fanny | | |
| | | dark green | 3 | Firdous, Mutsu, Prima , Green Sleeves | | |
| 12 * + | Leaf blade: incision of margin (Upper half) | | | | | |
| | | crenate | 1 | Mayan, Summerred | c | VS |
| | | bicrenate | 2 | Granny Smith, Vista Bella, Gold Spur | | |
| | | serrate type 1 | 3 | Starking Delicious | | |
| | | serrate type 2 | 4 | Cox's Orange Pippin, Silver Spur | | |
| biserrate | 5 | Red Gold | | | | |
| 13 + * | Leaf blade: size of stipules | | | | | |
| | | Absent | 1 | Anna | c | VS |
| | | very small | 2 | Black Ben Davis, Cox's Orange Pippin, Braeburn | | |
| | | small/ narrow | 3 | Granny Smith, Starkrimson Gold, Star Summer Gold, Starkrimson, Top Red, Winter Commercial | | |
| | | medium | 5 | Coe Red Fuji, Spartan, American Apirouge , Silver Spur , Golden Delicious , Red Fuji, Gold Spur, Red Chief, Oregon Spur, Parkin's Beauty | | |
| | | broad/large | 6 | Antonovka , Benoni, | | |
| large | 7 | Lemon Guard, Prima | | | | |
| 14 | Onset of flowering | | | | d | VG |
| | | early | 1 | Anna, Mai Gold, | | |
| | | mid | 3 | Granny Smith, Vance Delicious | | |
| | late | 5 | Starking Delicious , Top Red, Ambri | | | |
| 15 * + | Flower: arrangement of petals | | | | | |
| | | free | 3 | Michal, Shireen, Black Ben Davis, Antonovka, King Hasicus, Rich-a-Red , | d | VS |
| intermediate | 5 | Coe Red Fuji, Parkin's Beauty, Prima, Summerred, Wilson Red June, June Eating Starkrimson, | | | | |

| | | | | | | |
|--------------|---|---------------------|---|--|---|----|
| | | over lapping | 7 | American Apirouge, Cox's Orange Pippin , Red Baron | | |
| 16 * + | Flower: position of stigmas relative to anthers | below | 1 | King Hasicus, Shireen, Black Ben Davis, Mollies Delicious , Jonica, Hardiman, Starking Delicious | d | VS |
| | | same level | 3 | Starkrimson, Summerred, Michal, Rich-a-Red , Starkrimson Gold, Wilson Red June | | |
| | | above | 5 | Granny Smith, Golden Delicious | | |
| | | | | | | |
| 17 * + | Flower: predomina nt color at baloon stage (RHS COLOR CHART NO.) | white | 1 | Early Mc Intosh, Florina, Starking Delicious | d | VG |
| | | yellowish pink | 2 | Tydeman's Early Worcester, | | |
| | | light pink | 3 | Cooper IV, Starkrimson, Anna, Michal, June Eating, Prima, Granny Smith, Mayan, Oregon Spur, Tallisare, Top Red, Vista Bella, | | |
| | | dark pink | 4 | Hardiman, Silver Spur, Coe Red Fuji, Red Gold, Red Fuji, Scarlet Gala, Summerred, Spartan | | |
| | | red | 5 | Firdous | | |
| | | purple | 7 | - | | |
| 18 | Fruit let: Anthocyani n colouration | weak | 1 | Granny Smith, Golden Delicious , King Hasicus | f | VS |
| | | medium | 3 | Red Spur, Rome Beauty | | |
| | | strong | 5 | Spartan | | |
| | | | | | | |
| 19 | Fruit: weight (g) | small(<60) | 3 | Starkrimson Gold, American Apirouge | f | MS |
| | | medium(60-120) | 5 | Golden Delicious, Coe Red Fuji | | |
| | | large(120-240) | 7 | Vista Bella, Hardiman, | | |
| | | extra large (>240) | 9 | Mollies Delicious, Yellow Newton | | |
| | | | | | | |
| 20 * + | Fruit: shape | conical | 1 | Starking Delicious, Spartan, Silver Spur, Firdous, Red Chief, Oregon Spur, Royal Delicious, Top Red, Laxton's Fortune , Rich -a - Red, Ambri | f | VS |
| | | cylindrical | 2 | Tallisare, Skyline Supreme, | | |
| | | cylindrical waisted | 3 | Mollies Delicious, Starkrimson, Cooper IV, Red Delicious, Hardiman, | | |
| | | ellipsoid | 4 | Scarlet Gala, Wilson Red June, | | |
| | | globose | 5 | Coe Red Fuji, Granny Smith, Red Gold, Benoni, Pink lady, Prima, Michal, Winter Commercial, Starkrimson Gold, | | |
| | | obloid | 6 | Vista Bella, American Apirouge, Gold Spur, Tydeman's Early Worcester, June Eating, Red Baron, Green Sleeves, Parkin's Beauty | | |
| | | ovoid | 7 | Summerred, Shireen | | |
| | | | | | | |
| 21 * + | Fruit: size of eye basin (mm) | small (<1.5) | 3 | Granny Smith, American Apirouge, Golden Delicious, Benoni, Laxton's Fortune , Ambri, Rome Beauty, King Hascias | f | MS |
| | | medium (1.5-2.0) | 5 | Coe Red Fuji, Spartan, Vista Bella, Gala Mast, Mollies Delicious, Silver Spur, Firdous, Gold Spur, Red Chief, Oregon Spur | | |
| | | large(>2.0) | 7 | Starkrimson, Cooper IV, Shireen, Hardiman, Prima, Rich -a - Red, , Michal, June Eating, | | |
| | | | | | | |
| 22 | Fruit: | | | | | |

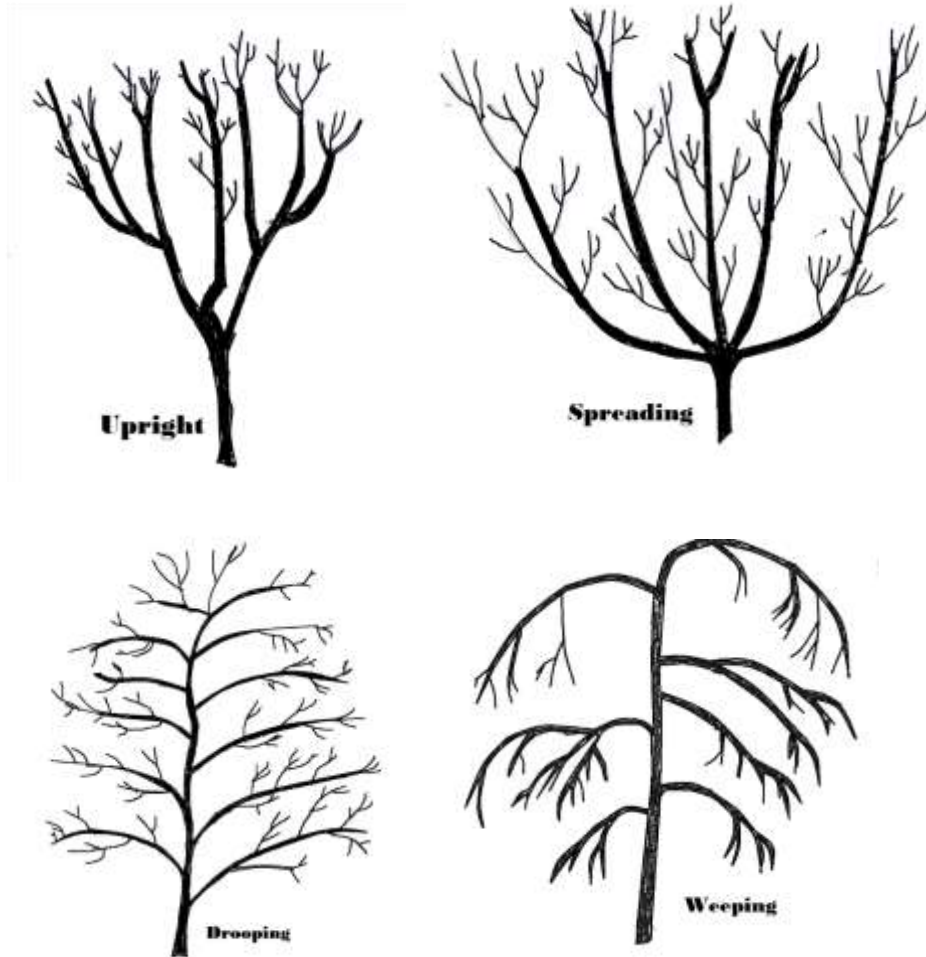
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|-----------|--|--------------------|---|---|---|----|
| | firmness of flesh (psi) | soft (<25) | 3 | Hardiman, Red Delicious, Michal, Jonica, Mayan | f | MS |
| | | medium (25-30) | 5 | Spartan, Golden Delicious, Red Fuji, Oregon Spur, Tydeman's Early Worcester, Pink lady, Laxton's Fortune , Prima, Summerred | | |
| | | firm (>30) | 7 | Red Chief, Coe Red Fuji, Vista Bella, Gala Mast, Starkrimson, Mollies Delicious, Cooper IV | | |
| 23 | Fruit: length of stalk (cm) | | | | f | MS |
| * | | very short (<0.65) | 1 | Jonathan, Granny Smith, Starkrimson, Cox's Orange Pippin, Vance Delicious, Jonathan, | | |
| | | short (0.65-1.0) | 2 | Mc Spur, Vista Bella, Golden Delicious, Pink lady, Green Sleeves, Starking Delicious | | |
| | | medium (1.0-1.9) | 3 | Hardiman, Florina, | | |
| | | long (1.9-2.35) | 4 | Silver Spur, Rich -a - Red, Coe Red Fuji, Gala Mast, Mollies Delicious, Cooper IV, American Apirouge , Silver Spur | | |
| | | very long (>2.25) | 5 | Top Red, Spartan, Red Delicious, Tydeman's Early Worcester, Benoni, Winter Commercial, Skyline Supreme | | |
| 24 | Fruit: depth of stalk cavity (cm) | | | | f | MS |
| * | | shallow (<1) | 1 | Vista Bella, Granny Smith, American Apirouge , Golden Delicious, Gold Spur, Hardiman, Summerred, Scarlet Gala, Red Baron, | | |
| + | | medium(1.0-2.0) | 3 | Well Spur, Coe Red Fuji, Gala Mast, Starkrimson, Silver Spur, Red Chief, Starking Delicious | | |
| | | deep (>2.0) | 5 | Oregon Spur, Jonagold, Spartan, Cooper IV, Top Red, Tydeman's Early Worcester, Benoni, Michal, Skyline Supreme, Well Spur | | |
| 25 | Fruit: prominence of lobes at calyx end | | | | f | VS |
| * | | absent | 1 | Winter Commercial | | |
| + | | weak | 3 | Granny Smith | | |
| | | moderate | 5 | Jonathan | | |
| | | strong | 7 | Starkrimson, Mollies Delicious, Red Delicious, Hardiman | | |
| 26 | Fruit: bloom of skin | | | | f | VG |
| * | | weak | 1 | Pink lady, Granny Smith, Summerred, June Eating, Red Baron, Green Sleeves | | |
| + | | moderate | 3 | Coe Red Fuji, Vista Bella, Gala Mast, Mollies Delicious, American Apirouge, Golden Delicious, | | |
| | | strong | 5 | Vista Bella, Spartan, Starkrimson, Cooper IV, Silver Spur, Gold Spur, Red Chief, Starking Delicious | | |
| 27 | Fruit: greasiness of skin | | | | f | VG |
| * | | absent or weak | 1 | Anna, Pink lady, Vista Bella, Green Sleeves | | |
| | | moderate | 3 | Granny Smith, Coe Red Fuji, Gala Mast, Mollies Delicious, American Apirouge, Golden Delicious | | |
| | | strong | 5 | Starkrimson, Jonagold, Cooper IV, Spartan, Silver Spur, Red Chief, Oregon Spur, Starking Delicious | | |
| 28 | Fruit: over color | | | | f | VS |
| | | very small | 1 | Granny Smith, Prima | | |
| | | small | 3 | Cox's Orange Pippin | | |
| | | medium | 5 | Gala Mast, Coe Red Fuji | | |
| | | large | 7 | Spartan, Starkrimson | | |
| 29 | Fruit: | | | | | |

| | | | | | | |
|---------|--|--|---|---|---|----|
| * | pattern of over color | only solid flush | 1 | Rich –a – Red , Gold Spur, Green Sleeves, Spartan, American Apirouge, Golden Delicious | f | VS |
| | | solid flush with weakly defined stripes | 2 | Well Spur, Oregon Spur, Ambri, Red Baron, Vista Bella | | |
| | | solid flush with strongly defined stripes | 3 | Red Chief, Top Red, Gold Spur, Royal Delicious, Tydeman’s Early Worcester, Benoni, Mayan | | |
| | | weakly defined flush with strongly defined stripes | 4 | Vance Delicious, Winter Commercial, Ambri | | |
| | | flushed and mottled | 5 | Firdous, Red Gold, Granny Smith, Early Mc-Intosh, Rome Beauty, Lemon Guard | | |
| | | flushed striped and mottled | 6 | Skyline Supreme, Tallisare | | |
| 30 * | Fruit: area of russet around Stalk attachment | small | 3 | Vista Bella, Cox’s Orange Pippin, Silver Spur, Starkrimson, Red Fuji, Red Gold, Tydeman’s Early Worcester | f | VG |
| | | medium | 5 | Golden Delicious, Laxton’s fortune, Black Ben Devis | | |
| | | large | 7 | ----- | | |
| 31 * | Fruit: area of russet on cheeks | absent | 1 | Granny Smith, Coe Red Fuji, Vista Bella, Spartan, Gala Mast, Mollies Delicious, Cooper IV, American Apirouge, Silver Spur | f | VS |
| | | small | 3 | Starkrimson, Red Gold, Tydeman’s Early Worcester, Prima, | | |
| | | medium | 5 | Laxton’s Fortune, Golden Delicious, Black Ben Devis, Cox’s Orange Pippin, | | |
| | | large | 7 | Golden Delicious, Yellow Newton | | |
| 32 | Fruit: area of russet around eye basin | absent | 1 | Coe Red Fuji, Granny Smith, Spartan, Gala Mast, Starkrimson, Mollies Delicious | f | VS |
| | | small | 3 | Laxton’s Fortune, Red Gold, Tydeman’s Early Worcester, Prima, Rich –a – Red, Michal | | |
| | | medium | 5 | Cox’s Orange Pippin | | |
| | | large | 7 | Golden Delicious, Yellow Newton | | |
| 33 | Fruit: number of lenticels | few | 1 | James Grieves, Granny Smith, American Apirouge, Red Chief, Red Gold | f | MS |
| | | medium | 3 | Starkrimson, Coe Red Fuji, Spartan, Cooper IV, Gold Spur, Top Red, Laxton’s fortune | | |
| | | many | 5 | Vista Bella, Gala Mast, Mollies Delicious, Silver Spur, Golden Delicious, Oregon Spur | | |
| 34 * | Fruit: colour of flesh | whitish | 1 | Spartan, Cox’s Orange Pippin, | f | VG |
| | | creamy | 2 | Gala Mast, Starkrimson, Coe Red Fuji, Mollies Delicious, Cooper IV, | | |
| | | pinkish | 3 | Red Gold, Pink Lady, Vista Bella, American Apirouge, Silver Spur, | | |

| | | | | | | |
|----------------|------------------------------------|-------------------|---|---|---|----|
| | | greenish | 4 | Granny Smith | | |
| | | yellowish | 5 | Scarlet Gala, Shireen, Red Gold, Skyline Supreme, | | |
| 35 | Fruit maturity: days (DAFB) | | | | | |
| | | very early (< 90) | 1 | Vista Bella, Scarlet Gala, Laxton's Fortune | g | MG |
| | | early (90-105) | 3 | Michael, Summerred, Benoni, | | |
| | | medium (105-130) | 5 | Gala Mast, Starkrimson, | | |
| | | late (130-170) | 7 | Golden Delicious, Coe Red Fuji, American Apirouge | | |
| very late >170 | 9 | Granny Smith | | | | |

IX. Explanations on the table of characteristics

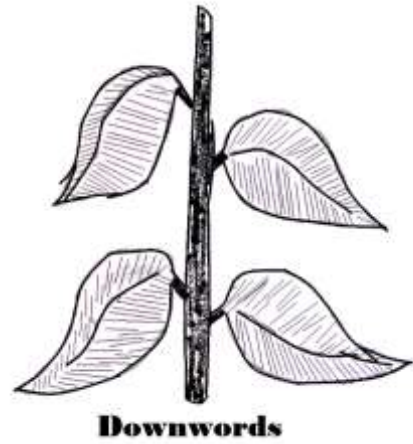
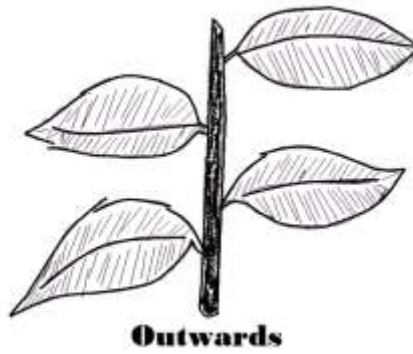
Characteristics 3: Tree habit



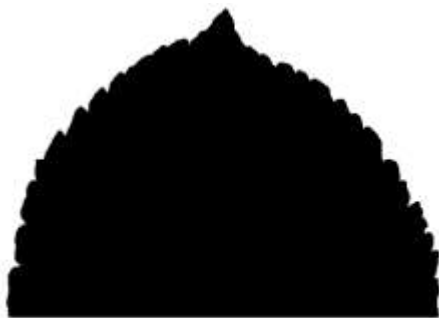
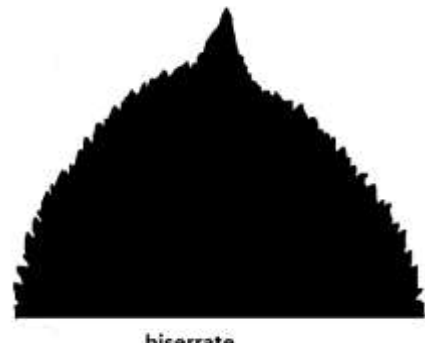
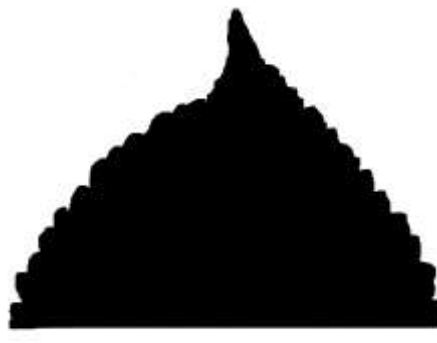
Characteristic 4: Type of bearing habit



Characteristics 6: Leaf Blade ; Altitude in relation to shoot



Characteristics 13: Leaf blade: Incision of margin upper half.



Characteristics 14: Size of stipules



Anna (Absent)



Very Small



Small



Medium

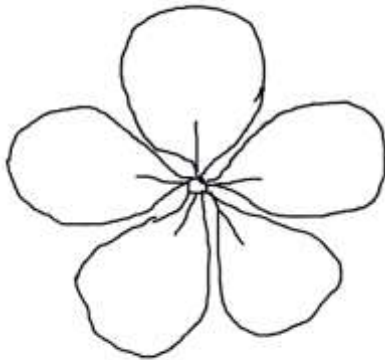


Broad/Large

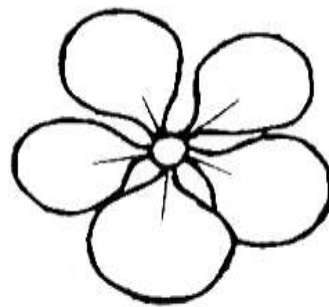


Large (Narrow)

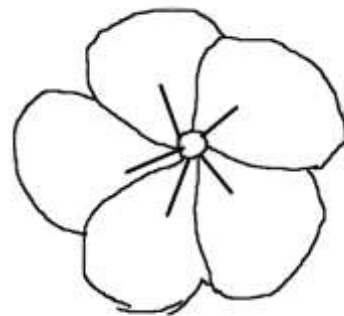
Characteristics 16: Flower - arrangement of petal



Free

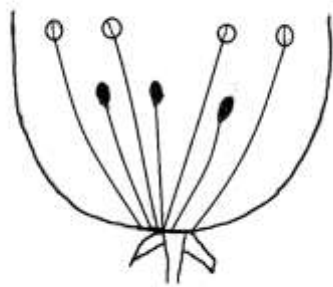


Intermediate

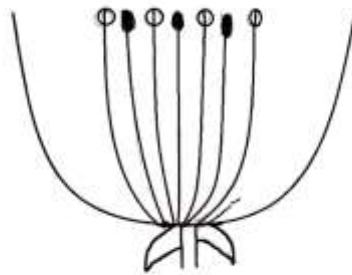


Overlapping

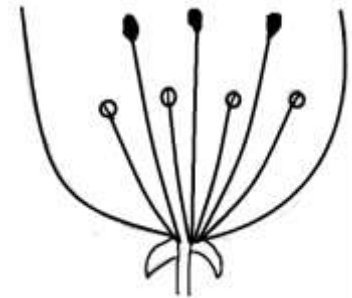
Characteristics 17: Flower: Position of stigma in relation to anthers



Below

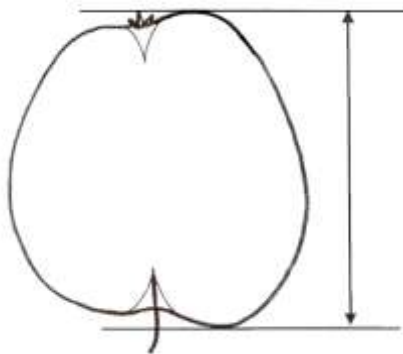


Same Level

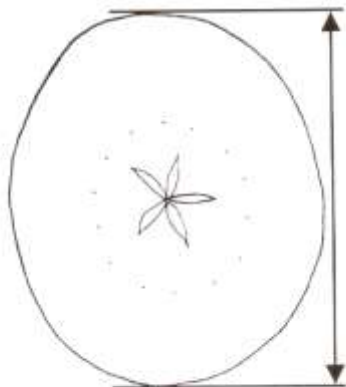


Above

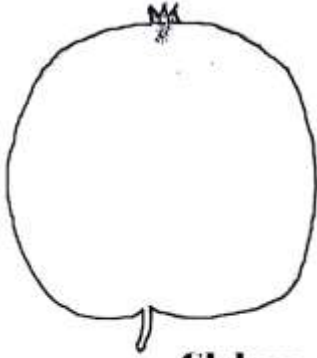
Characteristics 21: Fruit Height



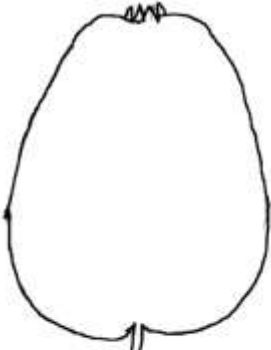
Characteristics 22: Fruit diameter



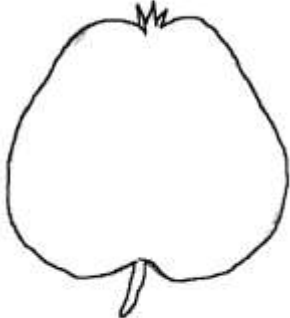
Characteristics 24: Fruit general shape



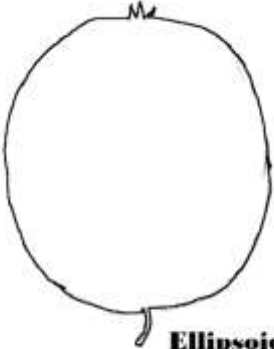
Globose



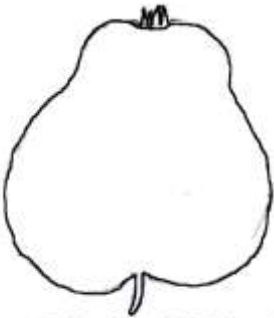
Ovoid



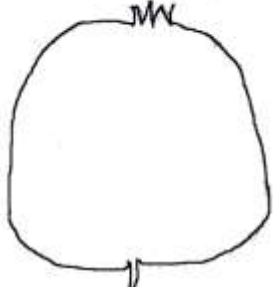
Conic



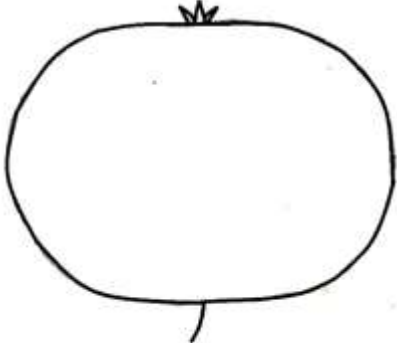
Ellipsoid



Cylindrical Waisted

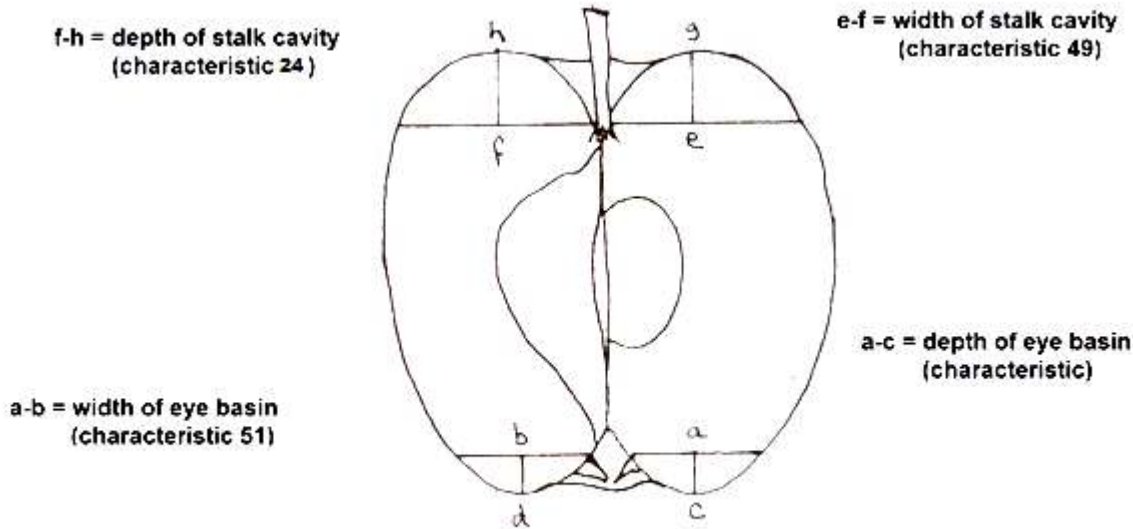


Cylindrical



Obloid

Characteristics 24:Fruit depth and width of stalk cavity ; depth and width of eye basin .



Working Group details:

The Test Guidelines were developed at Central Institute of Temperate Horticulture, Srinagar, J&K. Under the supervision of Dr. K.K. Srivastava, Senior Scientist as PI and Assisted by Dr. B. Das, Sr. Scientist, Dr. J. I. Mir, Scientist and Research Associates Mr. J.A. Rather, Dr. S.M. Razvi and Dr. Tejbir Singh, Registrar, PPV&FRA New Delhi. The suggestions and technical inputs were provided by the following task force (4/2012) constituted by the PPV&FR Authority in development and finalization of this DUS test guidelines.

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