MINIMAL DESCRIPTORS OF AGRIHORTICULTURAL CROPS
PART III: FRUIT CROPS

Compiled by:

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This publication Minimal Descriptors of Agri-Horticultural Crops. Part III: Fruit Crops is a compilation based on series of discussions and feedback information from different Crops Germplasm Advisory Committees, Annual Crop Workshops and Group Meetings including on fruit crops. Descriptor lists for various crops published by International Plant Genetic Resources Institute have also been consulted while developing this publication.

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Front cover : (Left to right) Strawberry, Litchi, Ber, Jamun, Citrus, Mango, Papaya, Aonla, Cherry, Bael, Apple

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PREFACE

Plant genetic diversity is the key component of agricultural production system. Without it no natural evolutionary adjustment of the system to changing environment and biotic conditions would be possible. Since the world is dynamic, the need for diversity is continuous. It is also increasing, because the number of people that are to be fed, kept warm, housed and cured is increasing. Because of this, people are increasingly aware of the importance of returning to nature of better ways to do things. India is richly endowed with rich plant wealth which have been utilised either directly for cultivation or as a source of useful traits for breeding improved varieties. Collection, conservation and sustainable use of these genetic resources and their wild relatives require specific attention keeping in view their overall importance and significance in agriculture and food security vis-a-vis day to day needs in human life. Indian National Plant Genetic Resource System (IN-PGRS) under the aegis of the Indian Council of Agricultural Research, spearheaded by the National Bureau of Plant Genetic Resources (NBPGR) has emerged as a dynamic system which now holds prominent place among the global genebanks. Since its inception, the NBPGR has assembled a sizeable germplasm collection of over 2,28,744 accessions of different agri-horticultural crop species and their wild relatives till June, 2001 and this needs to be evaluated for purposeful utilisation in crop improvement programmes. For characterisation and preliminary evaluation, descriptor lists of different crops are required, so that data may be recorded uniformly by crop curators.

Basic unit in Plant Genetic Resources information management is the descriptor. Hence, data need to be standardised in terms of descriptor or descriptor states for making an information system meaningful and applicable. The International Plant Genetic Resources Institute (IPGRI) has developed uniform standard for scoring, coding and data recording for most of the crops. Since the descriptor lists developed by the IPGRI are very exhaustive, it is very difficult to record data on all the descriptors with limited resources. This warranted us to reduce the list to only very important and relevant descriptors for each crop species. While preparing this publication, IPGRI’s descriptor lists have been consulted a great deal.

Based on our requirements and feedback from different Crop Germplasm Advisory Committees and Annual Crop Workshops, the NBPGR has developed Minimal Descriptor Lists for over 200 agri-horticultural crops. Part I of this publication deals with descriptor lists of 43 agri-horticultural crops, Part II: Vegetable Crops contains descriptor lists for 42 vegetable crops, whereas the current publication Part III deals with 36 temperate, sub-tropical, tropical and arid fruits, Part IV for medicinal and aromatic plants, Part V will deal on descriptors of forage legumes & grasses and agro-forestry species and Part VI will accommodate descriptor lists of the remaining agri-horticultural crops.
Under the National Agricultural Technology Project on Plant Biodiversity, the NBPRG has planned to undertake over 1100 explorations to collect agri-horticultural germplasm diversity from different agro-climatic zones of the country and plans to augment its base collection by over 0.1 million accessions. The collected diversity will be characterised and evaluated at the NBPRG headquarters, its regional stations/base centres and at different National Active Germplasm Sites (NAGS), different ICAR crop based institutes, National Research Centres (NRCs), Crop Coordinating units, SAUs, other Government and Non-Government organisations. This task is being accomplished in mission mode manner.

Developing minimal descriptors for characterisation and evaluation of different agri-horticultural crops including fruits is a pre-requisite for the National Database on Plant Genetic Resources. We hope that this publication *Minimal Descriptors of Agri-Horticultural Crops. Part III: Fruit Crops* will help fruit crop scientists, crop curators, orchardists, botanists and breeders in adopting uniform definitions of descriptors and descriptor states and, thereby, enable them to generate a standardised, authentic and uniform data so that a sound database networking may be developed for exchange and utilisation of information.

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We owe our gratitude to International Plant Genetic Resources Institute (IPGRI), Rome, Italy for allowing us to use some of the descriptor states and their definitions along with figures to develop this minimal descriptor list for the use of germplasm scientists. We appreciate and thank Dr Bhag Mal and Dr P.N.Mathur, IPGRI South Asia Office, National Agricultural Science Centre (NASC), Pusa, New Delhi, India for their continued support and help in accomplishing this task.

We also thank Dr S.K. Pareek, Principal Investigator, National Agricultural Technology Project on Plant Biodiversity; Dr G. Kalloo, Deputy Director General (Horticulture), Indian Council of Agricultural Research, New Delhi; Dr I.S. Yadav, Former Director, Indian Institute of Horticultural Research, Bangalore (Karnataka); all subject matter specialists; contributors and reviewers from different institutes/organisations for providing and sharing invaluable information to accomplish this important task. We are also thankful to Shri Satender Pal for his help in developing descriptors database and word processing.

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Guava and Mango

Aonla, Ber, Citrus, Datepalm, Jamun, Karonda, Lasora, Phalsa and Sapota

Almond, Apple, Apricot, Cherry, Peach, Pear, Plum, Strawberry and Walnut

Cashew

Grape

Citrus

CONTENTS

Preface ........................................................................................................................................ iii
Acknowledgements .................................................................................................................... v
Contributors and Reviewers ...................................................................................................... vii

Minimal Descriptors for Characterisation and Preliminary Evaluation .............................. 3-17
• Evaluation site data ............................................................................................................... 4
• Characterisation and Preliminary evaluation ....................................................................... 4
• Methods of propagation of fruit crops ................................................................................ 8
• The rootstock used ............................................................................................................... 9
• Methodology for Germplasm Characterisation/Evaluation Trials .................................. 10
• Use of standard checks ....................................................................................................... 10
• Pollination ........................................................................................................................... 10
• Guidelines for recording descriptors ................................................................................ 13

I. Tropical and Sub-tropical fruits ......................................................................................... 19-192
  Aonla ................................................................................................................................. 21-26
  Bael ................................................................................................................................. 27-31
  Banana ............................................................................................................................. 32-40
  Ber ..................................................................................................................................... 41-48
  Carambola ....................................................................................................................... 49-53
  Cashew ............................................................................................................................. 54-60
  Citrus ................................................................................................................................. 61-72
  Coconut ............................................................................................................................... 73-79
  Custard apple .................................................................................................................... 80-85
  Date palm ......................................................................................................................... 86-91
  Fig ..................................................................................................................................... 92-95
  Grapes ............................................................................................................................... 96-103
  Guava ................................................................................................................................. 104-108
  Jackfruit ............................................................................................................................. 109-117
  Jamun ................................................................................................................................. 118-122
  Karonda ............................................................................................................................. 123-127
  Lasora .................................................................................................................................. 128-131
  Litchi ................................................................................................................................... 132-137
  Loguata .............................................................................................................................. 138-143
  Mango ................................................................................................................................. 144-150
  Mangosteen ....................................................................................................................... 151-154
  Mulberry ............................................................................................................................ 155-159
  Papaya ................................................................................................................................. 160-167
  Phalsa ................................................................................................................................. 168-171
Pineapple.............................................. 172-179
Pomegranate....................................... 180-185
Sapota.............................................. 186-192

II. Temperate Fruits ................................................................. 193-242

Almond .............................................. 195-200
Apple .............................................. 201-206
Apricot ............................................ 207-211
Cherry ............................................ 212-216
Peach .............................................. 217-222
Pear .............................................. 223-228
Plum .............................................. 229-233
Strawberry ....................................... 234-237
Walnut ............................................ 238-242
MINIMAL DESCRIPTORS OF
AGRI-HORTICULTURAL CROPS

PART III: FRUIT CROPS
Characterisation and preliminary evaluation, in the context of genetic resources work, is the description of the material in a collection. This includes incorporation of all the information related to a collection (accession). The information obtained is applied in a number of areas including:

1. **Answering queries:** Supplying to user, often a plant breeder, with the accessions most nearly suited to his needs or with information on which he may make his own selections.

2. **General studies:** For example, investigating the patterns of diversity in a crop and relating this to its origins and history.

Implicit in the concept of evaluation is that the attributes scored have some genetic basis so that the traits described are passed from generation to generation within an accession or can be expected to appear in the progeny of a breeder's cross. Hence, the ideal would be to describe genetic resources in terms of genes and alleles rather than phenotypic descriptors. Only rarely can this ideal be reached, however, it can suggest ways in which the most useful evaluation can be carried out.

The International Plant Genetic Resources Institute (IPGRI) makes a distinction for practical purposes between characterization and detailed evaluation (see page 4). The descriptors distinguish those traits, which can be considered highly heritable and environmentally stable from those whose expression generally depends on the conditions in which they are assessed. The practice of evaluation begins with the adoption of a descriptor list. Based on our requirements and feedback from different Crop Germplasm Advisory Committees and discussions in Annual Crop Workshops, the National Bureau of Plant Genetic Resources (NBPGR), New Delhi has developed Minimal Descriptor lists for over 140 agri-horticultural crops and is in the process of developing some more such descriptor lists wherein IPGRIs Descriptor lists for different crops were consulted a great deal. Descriptor lists for 43 field crops and 42 vegetable crops have been published in part I & II of Minimal Descriptors of Agri-horticultural crops respectively.
**Characterisation and Preliminary Evaluation**

### Distinction between characterisation and evaluation

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<thead>
<tr>
<th>S.No.</th>
<th>Characterisation</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The description of attributes which, for a given genotype, may be considered invariant.</td>
<td>The assessment in described environments, or under specified conditions of traits which are known to be environmentally sensitive.</td>
</tr>
<tr>
<td>2</td>
<td>Qualitative, environmentally stable, mono-＞ oligogenic, easily manipulated in breeding.</td>
<td>Quantitative, environmentally influenced, oligo-＞ polygenic, not so easily manipulated.</td>
</tr>
</tbody>
</table>

For example:
- Seed patterns, flower patterns, isozyme patterns
- Plant height, protein content, days to maturity

The data recorded for each plant accession fall in two sections as follows:

**(a) Evaluation site data**

This includes all basic information about site where the germplasm is evaluated. Evaluation site data are common for a set of accessions pertaining to a particular species and evaluated under a specific environment. The information should be recorded on the parameters as given in the evaluation site data (see page 16). A mention of the breeding history (for 'advanced' material) and taxonomy etc. are also appended in the site note.

**(b) Characterization and preliminary evaluation of fruit crops**

This is the basic description work and is considered to be the direct responsibility of the curator. It includes basic morphological description of accessions (characterization) which may enable any subsequent contamination or mix-up of accessions to be identified. The extent of this description depends very much on the species in question.

Germplasm evaluation in broad sense and in the context of genetic resources work, is the description of the material in a collection. It involves whole range of activities starting from the receipt of new samples by the curator and growing these for seed/plant increase, characterisation and preliminary evaluation, and also for further detailed evaluation and documentation. During evaluation it is important that attributes scored have some general and uniform basis, so that the traits described are passed from generation to generation within an accession or can be expected to appear in the progeny of a breeder's cross. It would, therefore, be desirable to describe germplasm in terms of genes and alleles rather than phenotypic descriptors only.

Germplasm collected in the form of vegetative propagules are subject to quick drying and deterioration. In fruit crops the propagules are in the form of budwood, suckers and runners etc. Except otherwise compulsive, due to non-availability of vegetative propagules,
the fruit crops germplasm should not be collected in the form of seeds. The budwood of fruit trees should be utilized for propagation as early as possible, particularly of tropical and subtropical fruits, on suitable rootstock. Similarly, other propagules viz., cuttings for rooting, layers, suckers, slips, crowns, runners etc. for establishment and multiplication of germplasm should be utilized as early as possible. The fruit crops germplasm grown still through seeds are papaya, phalsa, karonda, lasara and to some extent Jackfruit although the resultant seedling may not be true to the type.

When a population is classified into distinct phenotypic classes for a given character, it is discontinuous variation and called as qualitative variation. Such characters are under the control of one or few genes. Such variations can be analysed by count and ratios like presence and absence of a character etc. When a character shows continuous variation from one end to another, it is called quantitative variation. Such characters are controlled by many genes with each gene contributing to the total phenotypic variation. Under qualitative characters, i) plant data, namely plant growth habit, stem shape, leaf lamina shape, ii) inflorescence and fruit data, namely, sex type, flower colour, fruit shape, fruit ridges per fruit, flesh texture etc. and in iii) seed data, such as seediness, seed cavity (small/medium/large) are scored in comparison to checks to determine variation within and among the traits. Quantitative characters such as plant height, days to 50% flowering, number of fruiting nodes per plant, number of pods per cluster, number of fruits, days to maturity are influenced by environment. These characters are responsible for yield.

Evaluation of fruit crops germplasm often needs inclusion or planting of a pollinator in the germplasm lines. In several cases where applicable a code of 1-9 scale should be followed. In case of petal colour, fruit skin colour or pulp colour etc. an ascending order should be followed (e.g. white, yellow, pink, brown, red, gray, blue, violet and black). Similarly for fruit shape an order of flat, round, globose, oval, oblong, cordate, elliptic, cylindrical, and arched should be followed. However, scope must be left to suitably incorporate specific positions like short-elliptical, broad-elliptical, narrowly-elliptical. The same will apply to other morphological descriptors like leaf shape, leaf apex, leaf base, fruits base, fruit apex, fruit beak and stone etc. Fruit taste, Total Soluble Solids content, flesh-stone ratio are highly important characters in fruit crops characterisation. Overall productivity status of the germplasm will reflect its use in breeding and commerce.

Beyond the basic characterisation for several agro-botanical and economic characters, some other characters are also of interest to breeders. Typically these include stress tolerance, disease and pest resistance and quality characters. Evaluation for many of these traits is outside the resources of most curators. They may require specialized laboratory or greenhouse work and the assistance of an expert familiar with the specific character and procedure for testing. Depending on circumstances, this work is collaborated with concerned
scientists of the same institute or collaborated with other organisations or may be contracted out to other institutes. The extent of this work depends on perceived needs of breeders. However, a provision has been made in the descriptor list to record preliminary information on reaction to biotic stresses, namely incidence of diseases and insects/pests along with recording of details of these under the head biotic notes.

The approach to scoring characters for characterization and preliminary evaluation work is a fundamental matter. The developing of descriptor lists has been done much to standardise practices to record data with consequent improvements by the breeders/curation.

There are four type of measurement data which cover the range of quantitative to qualitative characters. Both interval and ratio scales depend upon real unit (e.g., gram, metre) or are derived from them. Ordinal data generally require the construction of a standard scale, frequently on a 0-9 basis and definition in words and/or diagrams of what each of the scores mean. Here for most of the descriptors only five character states have been described and for most practical purposes this is probably sufficient. However, wherever justified, the intermediate values were also used. For nominal scale, the score has no meaning as a number in either absolute or relative terms with the descriptor state, but it may be the most convenient way to represent the data.

<table>
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<tr>
<th>Scale</th>
<th>Basis of observation</th>
<th>Examples</th>
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<tr>
<td>Interval</td>
<td>Direct measurement of an attribute</td>
<td>Height, days to flower, tuber weight, number of flowers per plant</td>
</tr>
<tr>
<td>Ratio</td>
<td>Combination of two direct measurement or inference from a single measurement</td>
<td>Harvest index, % protein, oil or sugar content</td>
</tr>
<tr>
<td>Ordinal</td>
<td>Assigning, sometimes subjectively, a relative value from a standard scale</td>
<td>Susceptibility to pests and diseases, overall processing quality, leaf or seed shapes</td>
</tr>
<tr>
<td>Nominal</td>
<td>Assignment of qualitative character states into arbitrarily numbered classes</td>
<td>Flower colour, seed patterns</td>
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It is important to be aware of the type of measurement being used in characterising/evaluating collections and its limitations when reviewing or processing information. This is especially true that computer databases are commonly used to store much of information in numeric form. The computer will not critically assess the reasonableness of any task and will, for example, calculate means and standard errors on nominal data (this can sometimes be seen in reports).
A clear definition of how a character is to be scored, either within or appended to a descriptor list, with accompanying diagrams or references, (if necessary) has been elaborated. Many characters are not as self-evident as might first be thought. Should flower colours be scored when they first open or later when they may be deepened? Does leaf length include the petiole? Is a plant mature when all the pods have turned brown or when they have dried as well? If the list is of general nature and does not clearly specify the standards, then the scoring method must be recorded to aid later interpretation.

Traits covered under characterisation are generally qualitative and easy to score and in theory need only be scored once. Handling and interpreting quantitative data presents greater problems since the absolute value obtained may depend greatly on the environment as it varies within and among trials. For this reason, a number of check lines need to be included as a standard for comparison to determine:

(i) what variation exists within a trial and what confidence can be placed on the scores,
(ii) the variation among trials and
(iii) whether a scored value can be considered 'good' or 'bad'. In some cases, they will also be needed as controls to verify that a particular test e.g., disease inoculation, has functioned correctly. In connection with disease observation in the field based on chance outbreaks, it is worth saying that non-incidence of disease may be due to either resistance or escape. Thus, it is safe to score diseased accessions as susceptible, but not clean ones as resistant.

The choice of check line will depend very much on circumstances. For preliminary evaluation, locally adapted cultivars and breeders, to provide understandable comparisons and a dependable way of monitoring trial-to-trial (often year to year) variation. For detailed evaluation which usually addresses one trait at a time, there will often be a well-recognized set of checks that cover the likely range of scores e.g., known resistant and susceptible cultivars or accessions for disease parameters. When data are subsequently queried, the scores should be related to these controls so that, for example, a request for early maturing accessions does not produce only those lines that happened to be grown under hot and dry conditions.

An additional problem is the question of Genotype x Environment (G x E) interaction. This has the practical consequence of significantly changing the constitution of accessions. In practice, the number of accessions processed in most genetic resources work is extensive and any one accession is likely to be evaluated only a few times, perhaps only once, for any one trait. It is, however, useful to monitor with the help of the check varieties for the
occurrence of G x E interaction among trials so as to realize the extent it can occur for any one character. An estimate can then be made as to the reliability of scores.

The major crop collections may now contain several thousand accessions. Such numbers may be too large for a scientist to evaluate in detail. In response to this, a trend of 'core' (a subset of the collection) are being developed in several crops, upon which work will be concentrated. The remainder of a collection forms a reserve, still maintained and available when desired trait cannot be found in the core. The overwhelming reason for establishing and maintaining core collection is their potential use in breeding. Evaluation is a key step in this process and deserves more attention.

In the collections, many accessions are genetically heterogeneous. This is inevitable for out breeding species, landraces, wild populations of inbreeding species. Only clonal material or 'advanced' inbreeding material is likely to be uniform. It does not follow that these accessions will show variation for all the traits; in many respects they may appear uniform and a single score will adequately describe the whole. Where between the plant variation is apparent, it is desirable to account for this; but a completely satisfactory approach does not appear to exist. Currently, it is only possible to list some options for evaluation:

(i) Split the accessions into uniform lines. Curators do this routinely on the basis of morphology with inbreeding species and so solve the problem of scoring. This will lead to increase in number of accessions. It is probably worthwhile where variation arises from species mixtures and possibly also where particularly desirable types could be selected. An alternative approach 'rouging off-types' is not recommended as it results genetic erosion within a collection.

(ii) Record only the mean. This is most convenient approach from the point of managing data.

(iii) Record the mean and variance for quantitative traits or the frequency of all the qualitative character's states. These give a reasonable picture of the accession but could result in a much longer database i.e., technically more difficult to interpret. It would also be unclear within any one accession, the extent to which quantitative variation was genetic or environmental.

(iv) Record variable traits as variable without any particular score. This may be an honest appraisal but provide little information for usage.

(c) Methods of propagation of fruit crops

The following methods are normally used for multiplication of fruit crops germplasm for characterisation and evaluation:
Seed

Layering - Air layering (gootee), stool (mound) layering and trench layering

Cutting - Hardwood, Semi hardwood and soft wood

Grafting - Tongue, cleft, inarching, veneer and whip grafting etc.

Budding - Shield (T), patch, chip, forkert and ring budding

Suckers - Slips, crowns, stem discs and crowndisc

Runner

Micropropagation - Tissue culture and shoot tip culture etc.

In vegetative propagation care must be taken for proper establishment of the material so that it may not be lost due to poor adaptation, biotic and abiotic stresses. Therefore, the plants must be multiplied in sufficient number. It is also important that the site for characterisation should be as close as possible to that of its original collection site to avoid climate effect on growth and fruiting behaviour of the germplasm.

(d) The rootstocks used

In situations where the germplasm has been propagated/multiplied through grafting and budding, it is apparent that a rootstock has been used. Two types of rootstocks are commonly used.

(i) Seedling rootstock:- Grown from the seeds of the same fruit crop or the seeds of any other related species which is graft compatible.

(ii) Standard/clonal rootstock:- These are normally available for some of the temperate fruit crops and are well defined for their characteristics viz. vigour, precocity, biotic and abiotic stress resistance etc.

It is important that a particular fruit crop germplasm be grafted/budded on the same rootstock. If seedlings are used as rootstock, the seeds must be collected from a single tree and grown to raise the seedlings to bring uniformity in the scion. On the other hand the clonal rootstock produces uniform scion. However, few important factors is to be kept in mind while using clonal rootstocks.

(i) Do not use the rootstocks which produce very vigorous or very dwarf trees.

(ii) Use only those clonal rootstock whose graft compatibility is well known.

(iii) The rootstocks which (a) produce a uniform graft union with scion or (b) even grows over the scion be preferred. Do not use rootstock where scion over-grows the rootstock.
(iv) Also avoid those rootstocks whose delayed incompatibility character has been reported.

(v) Same rootstock (seedling or clonal) is to be used for preparing the material for evaluation at all the sites.

(e) Methodology for Germplasm Characterisation/Evaluation Trials: Experimental Design

The fruit crops trees by their growth habit occupy too much space vertically and horizontally for their natural development. Each tree has to be given proper space. The row to row and plant to plant distance will depend on the ultimate vigour of the tree. A Randomized Block Design for most of the fruit crops germplasm evaluation may be therefore impracticable due to paucity of land in case of large number of accessions.

In such circumstances "Row Trial System" will be most ideal to be adopted. Thus 5-10 plants of an accession of fruit crops germplasm be grown in a single row. The single tree/plant may be considered as one replication. Tentatively following spacing can be adopted for fruit crops germplasm:

(i) Vigorous trees - 3.0 x 3.0 m
(ii) Medium vigorous trees - 2.5 x 2.5 m
(iii) Less vigorous - 2.0 x 2.0 m
(iv) Pineapple and strawberry etc. as per commercial crops

The row trial system provides scope for adding new germplasm in subsequent years when required. The entire experimental plot should be surrounded with border rows of wind-break plants/trees.

(f) Use of Standard Checks

In order to ascertain the comparative performance of each accession, it is advisable to include atleast one standard variety while evaluation. Qualitative and quantitative characters showing range of expression can only be meaningfully assessed in comparison with standard variety. As such locally adopted cultivars along with national recommended checks must be included in the germplasm lines for effective comparative study.

(g) Pollination

The pollinator facilitates fruit set in self-incompatible and self-unfruitful types. This will also enable the curator to identify cross-incompatible germplasm. However, this involves floral biology studies and usual pollination techniques. Such studies can be taken up as soon as the germplasm starts flowering.
For recording observation on vegetative growth parameters, only untrained, non-juvenile germplasm trees/plants are to be studied for characterisation and evaluation. The normal practices of training and pruning can be adopted when the tree comes in fruiting stage. The flower and fruiting characters can be recorded after about 5 years of tree growth except in banana, papaya, pineapple, strawberry etc.

The fruit crops are perennial in nature. Majority of the fruit crops come into flowering and fruiting after 3-5 years, if grown through grafting and budding. The fruit plants grown through seed (seedling) or on own roots (cutting, layering, sucker, runner, micro-propagation etc.) may take even more time to fruit. Moreover, many of them reach full (commercial) bearing after 10-15 years except in crops like banana, papaya, pineapple, strawberry etc. which start bearing after 1-2 years. The fruit crops trees also take 8-15 years to attain their full size. As such it is not even possible to describe their growth habit in early stage. It is, therefore, desirable to arrive at a compromising age of the tree when characterisation and evaluation can be taken up without waiting for the tree to reach in full bearing capacity. In many cases it has been suggested herein that the characterisation and evaluation of fruit crops be done in the 3rd year of bearing. However, if the fruiting starts in 1-2 years, these can be evaluated accordingly.
Sample data sheet for Recording Characterisation and Evaluation Data

<table>
<thead>
<tr>
<th>ID1</th>
<th>ID2</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>.....</th>
<th>C37</th>
<th>C38</th>
<th>C39</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC-10015</td>
<td>UC-112</td>
<td>2</td>
<td>3.2</td>
<td>3.6</td>
<td>3</td>
<td>99</td>
<td>.....</td>
<td>3</td>
<td>Insects: Mango hopper</td>
<td>Irregular-Combination of conical and pyramidal</td>
</tr>
<tr>
<td>IC-00020</td>
<td>IR-200</td>
<td>1</td>
<td>4.5</td>
<td>4.2</td>
<td>5</td>
<td>2</td>
<td>.....</td>
<td>1</td>
<td>Disease: Powdery mildew</td>
<td></td>
</tr>
<tr>
<td>IC-12140</td>
<td>UC-162</td>
<td>2</td>
<td>2.6</td>
<td>2.3</td>
<td>3</td>
<td>1</td>
<td>.....</td>
<td>5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IC-10145</td>
<td>KC-145</td>
<td>1</td>
<td>1.8</td>
<td>1.9</td>
<td>3</td>
<td>2</td>
<td>.....</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IC-00060</td>
<td>MN-540</td>
<td>1</td>
<td>3.6</td>
<td>3.8</td>
<td>7</td>
<td>3</td>
<td>.....</td>
<td>9</td>
<td>Insects: Stem borer</td>
<td></td>
</tr>
</tbody>
</table>

Note: ID1 - Accession number allotted by NBPGR (IC number); ID2 - Collector number; C1 - Type of planting material; C2 - Tree height (m); C3 - Tree spread (m); C4 - Foliage density; C5 - Inflorescence shape; C37 - Biotic stress susceptibility; C38 - Biotic notes; C39 - Remarks.
GUIDELINES FOR RECORDING DESCRIPTORS

Following are the useful guidelines for scoring and recording of characterisation and evaluation descriptors. These may be strictly followed.

a. Observations are to be recorded in the CGS system. The units are mentioned in parenthesis with the descriptor name;

b. Presence/absence of characters are scored as 0 (absent) and 1 (present);

c. Many quantitative descriptors which are continuously variable are recorded on a 1-9 scale, where:
   1 Very low
   2 Very low to low
   3 Low
   4 Low to intermediate
   5 Intermediate
   6 Intermediate to high
   7 High
   8 High to very high
   9 Very high

   are the expression of a character. If the character is not expressed, '0' should be recorded (see also (d)). For some characters, only a selected scores i.e., 1,3,5,7,9 are described. Where this has occurred, it shows the gradient (from very low to very high) for that particular descriptor;

d. When the descriptor state is inapplicable, '0' is used as the descriptor value, e.g. if an accession does not have a central leaf, '0' would be scored for the descriptor.
# Self-pollinated(SP)/Cross-pollinated (CP)/Parthenocarpic (P)

<table>
<thead>
<tr>
<th>Crop name</th>
<th>Status</th>
<th>Crop name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aonla</td>
<td>SP &amp; CP</td>
<td>Mango</td>
<td>CP</td>
</tr>
<tr>
<td>Bael</td>
<td>SP &amp; CP</td>
<td>Mangosteen</td>
<td>P</td>
</tr>
<tr>
<td>Banana</td>
<td>SP</td>
<td>Mulberry</td>
<td>CP</td>
</tr>
<tr>
<td>Ber</td>
<td>CP</td>
<td>Papaya</td>
<td>SP &amp; CP</td>
</tr>
<tr>
<td>Carambola</td>
<td>SP &amp; CP</td>
<td>Phalsa</td>
<td>SP</td>
</tr>
<tr>
<td>Cashew</td>
<td>CP</td>
<td>Pine apple</td>
<td>CP</td>
</tr>
<tr>
<td>Citrus</td>
<td>SP &amp; CP</td>
<td>Pomegranate</td>
<td>SP &amp; CP</td>
</tr>
<tr>
<td>Coconut</td>
<td>CP</td>
<td>Sapota</td>
<td>CP</td>
</tr>
<tr>
<td>Custard apple</td>
<td>CP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date palm</td>
<td>SP &amp; CP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fig</td>
<td>P</td>
<td>Almond</td>
<td>SP &amp; CP</td>
</tr>
<tr>
<td>Grapes</td>
<td>SP</td>
<td>Apple</td>
<td>SP &amp; CP</td>
</tr>
<tr>
<td>Guava</td>
<td>SP</td>
<td>Apricot</td>
<td>SP</td>
</tr>
<tr>
<td>Jackfruit</td>
<td>SP &amp; CP</td>
<td>Cherry</td>
<td>CP</td>
</tr>
<tr>
<td>Jamun</td>
<td>CP</td>
<td>Peach</td>
<td>CP</td>
</tr>
<tr>
<td>Karonda</td>
<td>SP</td>
<td>Pear</td>
<td>CP</td>
</tr>
<tr>
<td>Lasora</td>
<td>SP</td>
<td>Plum</td>
<td>CP</td>
</tr>
<tr>
<td>Litchi</td>
<td>CP</td>
<td>Strawberry</td>
<td>SP &amp; CP</td>
</tr>
<tr>
<td>Loquat</td>
<td>SP &amp; CP</td>
<td>Walnut</td>
<td>SP</td>
</tr>
</tbody>
</table>

For most of the qualitative characters the last state is ‘Others’, If a particular state is not present in the descriptor states, write the code ‘99’ for ‘Others’. Additional information for that descriptor may be appended in the ‘Remarks’ descriptor as follows:

i) if the red colour state is not listed, then the red colour is to be given in the Remarks column along with the name of the descriptor.

ii) if a particular descriptor is inapplicable, e.g., when the plant does not bear pods, the pods related descriptor(s) become inapplicable. Such state(s) are to be mentioned as ‘Inapplicable’ along with the notes under the Remarks column.
iii) for descriptors which are not generally uniform throughout the accession (e.g. mixed collection, genetic segregation), all the descriptor states should be mentioned in descending order of occurrence under the Remarks column (e.g. 50% red, 30% white, 10% yellow and 10% brown).

f. The severity or extent of infection or infestation may be recorded on 1-9 scale under the descriptor ‘Biotic Stress Susceptibility’. However the detailed information in respect of name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the ‘Biotic notes’ descriptor.

g. Dates should be expressed numerically in the format DD/MM/YYYY, where

\[
\begin{align*}
DD & \quad 2 \text{ digits to represent the Days} \\
MM & \quad 2 \text{ digits to represent the Month} \\
YYYY & \quad 4 \text{ digits to represent the Year}
\end{align*}
\]

h. Standard colour chart e.g. Royal Horticultural Society colour charts or computer simulated colour charts should be used to determine colour of the flower/other organs.
EVALUATION SITE DATA

1. Name of Place
2. Name of Tehsil/Taluka
3. Name of District
4. Name of State/Country
5. Name of Research Farm or Institutes (short names(s))
6. Name of Institutes (long name(s))
7. Latitude – degree and minute followed by N(North) or S(South)
8. Longitude – degree and minute followed by E(East) or W(West)
9. Altitude (meter)
10. Evaluator's/Curator's name(s) and address(es)
11. Sowing date or planting date (dd/mm/yyyy)
12. Harvest date (dd/mm/yyyy)
13. Harvesting period
14. Evaluation environment (environment in which the experiment was carried out)
   i. Field
   ii. Screen house
   iii. Green house
   iv. Laboratory
   v. Others (specify in site notes)
15. Seed germination (%)
16. Field spacing
   i. Distance between plants within a row(cm)
   ii. Distance between rows(cm)
17. Soil texture
   i. Highly organic
   ii. Clay
iii. Silt
iv. Silt sand
v. Sandy
vi. Sandy loam
vii. Loam
viii. Gravelly
ix. Others (specify in site notes)

18 Soil pH

Actual value of the soil in the root zone around the accessions.

19. Watering

i. Irrigation

ii. Rainfall

iii. Both/alternate

20. Fertilizers

Specify name(s) and dose(s)

21. Plant protection

Specify name of pesticide(s) and dose(s) of each

22. Climate during crop season

i. Temperature range (°C)

ii. Rainfall range (mm)

iii. Sunshine hours

23. Site Note/Breeding history/Taxonomy/Passport Information on site of collection
(any other specific information)
TROPICAL AND SUB-TROPICAL FRUITS
Aonla (Emblca officinalis Gaertn.)

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Cutting
   - 3 Layered
   - 4 Grafted
   - 5 Budded
   - 99 Others (Specify in the 'Remarks' descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative

5. **Tree shape**
   To be recorded at 'pea stage' of fruit
   - 3 Upright
   - 5 Spreading
   - 7 Drooping

6. **Young shoot colour**
   - 1 Light green
   - 2 Green
   - 3 Dark green
   - 99 Others (Specify in the 'Remarks' descriptor)
7. Foliage density
   To be recorded at 'pea stage' of fruit
   3 Sparse
   5 Medium
   7 Dense

8. Nature of branchlets
   To be recorded before flowering
   3 Weak
   5 Intermediate
   7 Strong

9. Number of branchlets per node
   To be recorded as average of 10 random nodes
   Quantitative

10. Foliage retention
    1 Deciduous
    2 Semi-deciduous
    3 Evergreen

11. Leaflet shape
    To be recorded on mature leaflet
    1 Ovate
    2 Oblong
    3 Oblong oval
    4 Oval
    5 Elliptical
    99 Others (Specify in the 'Remarks' descriptor)

12. Date of start of flowering (dd/mm/yyyy)
    To be recorded when 5% flower buds have opened
    Date

13. Date of end of flowering (dd/mm/yyyy)
    To be recorded when 85-90% flower buds have opened
    Date

14. Nature of flowering branchlet
    To be recorded during flowering
    1 Secondary branches
    2 Tertiary branches
    3 All branches
15. **Number of male flowers per branchlet**
   To be recorded as average of 5 random branchlets during flowering
   Quantitative

16. **Number of female flowers per branchlet**
   To be recorded as average of same 5 branchlets during flowering
   Quantitative

17. **Sex ratio**
   To be calculated as ratio of female flowers to total number of flowers
   Quantitative

18. **Female flower position on branchlet**
   Note: The male flowers appear in clusters in the axil of leaf mainly on lower half of the branchlets
   1. Upper portion of the branchlet
   2. Middle of the branchlet
   3. Both

19. **Fruit development pattern**
   1. No fruit growth for sometime after fruit set
   2. Continuous growth after fruit set

20. **Extent of fruit drop**
   3. Low
   5. Medium
   7. High

21. **Fruit maturity group**
   3. Early
   5. Mid
   7. Late

22. **Fruit shape**
   To be recorded on mature fruit
   1. Flattened round
   2. Flattened oblong
   3. Flattened oval
   4. Triangular
   5. Oval round
   99. Others (Specify in the 'Remarks' descriptor)
23. Fruit skin ground colour
To be recorded on mature fruit
1. Yellowish
2. Greenish yellow
3. Greenish
4. Russet-green
99. Others (Specify in the 'Remarks' descriptor)

24. Fruit skin over colour
To be recorded on mature fruit
1. White streaked
2. Green tinge
3. Pink tinge
4. Red tinge
99. Others (Specify in the 'Remarks' descriptor)

25. Bloom intensity
To be recorded as presence of white powdery substance on fruit
3. Low
5. Medium
7. High

26. Fruit length (cm)
To be recorded as average of 10 random mature fruits
Quantitative

27. Fruit width (cm)
To be recorded as average of same 10 fruits
Quantitative

28. Fruit weight (g)
To be recorded as average of same 10 fruits
Quantitative
29. Fruit base (cavity at stem-end)
To be recorded on mature fruit:
- 0: Absent
- 1: Shallow
- 2: Deep
- 99: Others (Specify in the 'Remarks' descriptor)

30. Fruit apex (stylar end)
To be recorded on mature fruit:
- 1: Depressed
- 2: Flat
- 3: Papillate
- 99: Others (Specify in the 'Remarks' descriptor)

31. Segment ridges at stem end
To be recorded on mature fruit:
- 0: Absent
- 3: Less prominent
- 5: Prominent

32. Number of segments in fruit
To be recorded as average of same 10 fruits
Quantitative

33. Fibre content
To be recorded on mature fruit:
- 0: Fibreless
- 3: Low
- 5: Medium
- 7: High

34. Pulp texture
To be recorded on mature fruit:
- 3: Soft
- 5: Medium
- 7: Hard

35. Pulp taste
To be recorded on mature fruit:
- 1: Acrid
- 3: Acidic
- 5: Medium sweet
36. Total soluble solids (%)  
To be measured with refractometer  
Quantitative

37. Ascorbic acid content (mg/100 g pulp)  
Quantitative

38. Seed size  
To be recorded on mature dried seed  
3 Small  
5 Medium  
7 Large

39. Stone wing nature  
To be recorded on mature and dry stone  
1 Alternate wings prominently protruded  
2 Alternate wings slightly protruded

40. Stone weight (g)  
To be recorded as average of stones of same 10 fruits  
Quantitative

41. Productivity status  
To be recorded at the time of harvest  
3 Low  
5 Medium  
7 High

42. Biotic Stress Susceptibility  
Specify the infestation or infection using 1-9 scale.  
Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.  
1 Very low or no visible sign of susceptibility  
3 Low  
5 Intermediate  
7 High  
9 Very high

43. Biotic notes  
Text

44. Remarks  
Text
Bael (*Aegle marmelos* Correa)

**Hindi:** Bael

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Sucker
   3. Budded
   99 Others (Specify in the 'Remarks' descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

5. **Tree habit**
   3. Upright
   5. Spreading
   7. Drooping

6. **Tree nature**
   1. Evergreen
   2. Partially deciduous
   3. Deciduous

7. **Young shoot colour**
   1. Pale green
   2. Green
   3. Dark green
   99 Others (Specify in the 'Remarks' descriptor)
8. **Foliage density**  
To be recorded during flowering  
3 Sparse  
5 Medium  
7 Dense

9. **Leaf colour**  
To be recorded on mature leaf  
1 Pale green  
2 Light green  
3 Dark green  
99 Others (Specify in the ‘Remarks’ descriptor)

10. **Central leaflet shape (trifoliate leaf)**  
To be recorded on mature leaf  
1 Ovate  
2 Ovate-oblong  
3 Oblong  
4 Oval  
5 Elliptical  
99 Others (Specify in the ‘Remarks’ descriptor)

11. **Leaflet apex**  
To be recorded on mature leaf  
1 Obtuse  
2 Acute  
99 Others (Specify in the ‘Remarks’ descriptor)

12. **Branch thorniness**  
To be recorded during flowering  
3 Less  
5 Medium  
7 High

13. **Date of start of flowering (dd/mm/yyyy)**  
To be recorded when 5% flower buds have opened  

Date

14. **Date of end of flowering (dd/mm/yyyy)**  
To be recorded when 85-90% flower buds have opened  

Date

15. **Date of first fruit maturity (dd/mm/yyyy)**  

Date
16. Date of last fruit maturity (dd/mm/yyyy)
   Date

17. Immature fruit drop
   3 Low
   5 Medium
   7 High

18. Number of fruits per tree
   To be recorded as average of 3 random trees
   Quantitative

19. Fruit maturity group
   To be recorded at the time of harvest
   3 Early
   5 Mid
   7 Late

20. Fruit shape
   To be recorded on mature fruit
   1 Spherical
   2 Pyriform
   3 Oblong
   4 Cylindrical
   5 Flat
   99 Others (Specify in the 'Remarks' descriptor)

21. Fruit length (cm)
   To be recorded as average of 5 random fruits
   Quantitative

22. Fruit width (cm)
   To be recorded as average of same 5 fruits
   Quantitative

23. Fruit weight (g)
   To be recorded as average of same 5 fruits
   Quantitative

24. Fruit skull colour
   To be recorded on ripe fruit
   1 Dull white
   2 Creamish yellow
   3 Greenish yellow
   4 Russet yellow
   5 Greenish
   99 Others (Specify in the 'Remarks' descriptor)
25. **Fruit cracking**  
To be recorded at the time of harvest  

| 0 | Absent  
| 1 | Present  

26. **Pulp colour**  
To be recorded on ripe fruit  

| 1 | Whitish yellow  
| 2 | Yellow  
| 3 | Deep-yellow  
| 99 | Others (Specify in the 'Remarks' descriptor)  

27. **Pulp fibre content**  
To be recorded on ripe fruit  

| 3 | Low  
| 5 | Medium  
| 7 | High  

28. **Fruit skull thickness (mm)**  
To be recorded as average of skull of same 5 fruits  

Quantitative  

29. **Mucilage content**  
To be recorded on ripe fruit  

| 3 | Less  
| 5 | Medium  
| 7 | High  

30. **Pulp taste**  
To be recorded on ripe fruit  

| 3 | Less sweet  
| 5 | Medium sweet  
| 7 | Sweet  

31. **Pulp acridity**  
To be recorded on ripe fruit  

| 0 | Absent  
| 1 | Present  

32. **Pulp flavour**  
To be recorded on ripe fruit  

| 3 | Mild  
| 5 | Moderate  
| 7 | Strong  

Bael (*Aegle marmelos Correa*)
33. Pulp weight (g)
   To be recorded as average of pulp of same 5 fruits
   Quantitative

34. Arrangement of seeds in pulp
   To be recorded on ripe fruit
   1 Arranged in straight line
   2 Distributed in whole pulp

35. Number of seeds per fruit
   To be recorded as average of seeds of same 5 fruits
   Quantitative

36. Total soluble solids (%)  
   To be measured with refractometer
   Quantitative

37. Productivity status
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

38. Biotic Stress Susceptibility
   Specify the infestation or infection using 1-9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and
   causal organism(s) may be appended in the Biotic notes descriptor.
   
   2 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

39. Biotic notes
   Text

40. Remarks
   Text
Banana (*Musa paradisiaca* L.)

**Hindi**: Kela

*Descriptors to be recorded on unpruned, untrained plants in the 1st year of bearing*

1. **Type of planting material**
   - 1 Sucker
   - 2 Rhizome
   - 99 Others (Specify in the ‘Remarks’ descriptor)

2. **Pseudo stem height (m)**
   To be recorded from the base of pseudostem to the emerging point of the peduncle
   Quantitative

3. **Pseudostem girth (cm)**
   To be recorded at 90 cm above the ground
   Quantitative

4. **Pseudostem colour**
   To be recorded without removing the external sheaths. The colour of oldest dry sheaths should not be considered
   - 1 Green yellow
   - 2 Medium green
   - 3 Green
   - 4 Dark green
   - 5 Green red
   - 6 Red
   - 7 Red purple
   - 8 Blue
   - 9 Chimerical
   - 99 Others (Specify in the ‘Remarks’ descriptor)

5. **Pigmentation of the underlying pseudostem**
   To be recorded after removing the outermost sheath from the pseudostem
   - 1 Whitish green
   - 2 Green
   - 3 Pink-purple
   - 4 Red
   - 5 Purple
   - 99 Others (Specify in the ‘Remarks’ descriptor)
6. **Ash coating on the pseudostem**  
   To be recorded at the time of harvest  
   1. No  
   2. Mild  
   3. Profuse

7. **Leaf habit**  
   To be recorded on mature leaf  
   1. Erect  
   2. Intermediate  
   3. Drooping

8. **Sap colour**  
   To be recorded after cutting the external sheath of the pseudostem  
   1. Colourless  
   2. Milky/Turbid white  
   3. Red-purple  
   99. Others (Specify in the ‘Remarks’ descriptor)

9. **Number of suckers per plant**  
   To be recorded as average of 5 random plants at flowering stage  
   Quantitative

10. **Petiole base blotches**  
    To be recorded on mature leaf  
    1. Sparse blotching  
    2. Small blotches  
    3. Large blotches  
    4. Extensive pigmentation  
    5. Without pigmentation

11. **Midrib dorsal surface colour**  
    To be recorded on mature leaf  
    1. Yellow  
    2. Light green  
    3. Green  
    4. Pink purple  
    5. Red purple  
    6. Purple to blue  
    99. Others (Specify in the ‘Remarks’ descriptor)
12. **Leaf blade base shape**  
   To be recorded on mature leaf  
   1. Both sides rounded  
   2. One side rounded, one side pointed  
   3. Both sides pointed  

13. **Petiole canal shape**  
   To be recorded on mature leaf  
   1. Open  
   2. Partially closed  
   3. Closed  

14. **Petiole length (cm)**  
   To be recorded on mature leaf  
   3. Short (< 40)  
   5. Medium (40 - 60)  
   7. Long (> 60)  

15. **Date of shooting (dd/mm/yyyy)**  
   Date  

16. **Presence of male axis (rachis)**  
   0. Absent  
   1. Present  

17. **Rachis hand**  
   To be recorded at the end of flowering  
   1. Falling vertically (Pendulous)  
   2. At an angle (Oblique)  
   3. With a curve  
   4. Horizontal  
   5. Erect  

18. **Rachis appearance**  
   To be recorded at the end of flowering  
   1. Barren  
   2. With persistent flowers  
   3. With persistent bracts  
   4. With both persistent flowers and bracts  

19. **Compound tepal basic colour**  
   To be recorded at flowering stage  
   1. White  
   2. Cream  
   3. Yellow  
   4. Orange  
   5. Pink/pink purple  
   99. Others (Specify in the 'Remarks' descriptor)
20. **Male bud shape**  
To be recorded as the shape of the male bud

1. Like a top  
2. Lanceolate  
3. Intermediate  
4. Ovoid  
5. Rounded

![Male bud shape](image)

21. **Tip of male bud**  
To be recorded during flowering  

1. Imbricate  
2. Non-imbricate

22. **Bract apex shape**  
To be recorded during flowering

1. Pointed  
2. Slightly pointed  
3. Intermediate  
4. Obtuse  
5. Obtuse and split

![Bract apex shape](image)
23. **External bract colour**  
To be recorded on the dorsal side during flowering stage  
1. Yellow  
2. Green  
3. Orange red  
4. Red  
5. Red purple  
6. Purple  
7. Purple brown  
8. Blue  
9. Pink purple  
99. Others (Specify in the ‘Remarks’ descriptor)  

24. **Internal bract colour**  
To be recorded on the ventral side during flowering  
1. Whitish  
2. Yellow  
3. Orange red  
4. Red  
5. Purple  
6. Purple brown  
7. Pink purple  
99. Others (Specify in the ‘Remarks’ descriptor)  

25. **Bract behaviour**  
To be recorded at just before bract falling  
1. Revolute (rolling)  
2. Not revolute (not rolling)  

26. **Bract colour fading**  
To be recorded on inner side of bract during flowering  
1. Colour fading towards the base  
2. Colour homogenous  

27. **Wax on the bract**  
To be recorded during flowering  
0. No visible sign of wax  
3. Slightly waxy  
5. Moderately waxy  
7. Profusely waxy
28. Stigma colour
   To be recorded during flowering
   1 Cream
   2 Yellow
   3 Bright yellow
   4 Orange
   5 Pink/pink-purple
   99 Others (Specify in the 'Remarks' descriptor)

29. Ovule arrangement
   To be observed as cross section of an ovary of just opened female flower
   1 Two regular rows
   2 Four irregular rows

30. Peduncle length (cm)
   To be recorded on ripe fruit
   3 Short (< 30)
   5 Medium (30 - 60)
   7 Long (> 60)

31. Peduncle hairiness
   To be recorded at the time of harvest
   0 Smooth/glabrous
   1 Pubescent

32. Position of fruits on the crown (fruit series)
   1 Uniseriate
   2 Biseriate

33. Date of harvesting (dd/mm/yyyy)
   Date

34. Number of fingers per hand (second hand)
   To be recorded as average of 3 random hands
   Quantitative

35. Number of hands per bunch
   To be recorded as average of 3 random bunches
   Quantitative

36. Fruit length (cm)
   To be recorded as average of 10 random middle fingers
   Quantitative
37. **Fruit width (cm)**
   To be recorded as average of same 10 fingers
   Quantitative

38. **Fruit weight (g)**
   To be recorded as average of same 10 fingers
   Quantitative

39. **Fruit shape**
   To be recorded on ripe fruit
   - 1 Straight
   - 2 Straight at the distal part
   - 3 Curved
   - 4 Curved in “S” shape
   - 99 Others (Specify in the ‘Remarks’ descriptor)

40. **Bunch weight (kg)**
   To be recorded as average of 3 random plants
   Quantitative

41. **Fruit apex**
   To be recorded on ripe fruit
   - 1 Pointed
   - 2 Prominently pointed
   - 3 Blunt tipped
   - 4 Bottle-necked
   - 5 Rounded
42. **Fruit skin colour**
   To be recorded on ripe fruit
   1. Yellow
   2. Bright yellow
   3. Orange
   4. Grey spots
   5. Orange red, red or pink / pink purple
   6. Red purple
   7. Brown/rusty brown
   8. Black
   99. Others (Specify in the 'Remarks' descriptor)

43. **Pulp colour**
   To be recorded on ripe fruit
   1. White
   2. Cream
   3. Ivory
   4. Yellow
   5. Orange
   6. Pinkish
   99. Others (Specify in the 'Remarks' descriptor)

44. **Pulp texture**
   To be recorded on ripe fruit
   3. Firm
   5. Intermediate
   7. Soft

45. **Pulp taste**
   To be recorded on ripe fruit
   1. Astringent
   2. Mild
   3. Sweet
   4. Highly sweet
   5. Sweet and acidic
   99. Others (Specify in the 'Remarks' descriptor)
46. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

47. **Presence of seeds**
   To be recorded on ripe fruit
   0 Absent
   1 Present

48. **Seed shape**
   To be recorded on ripe fruit
   1 Flat
   2 Angular (more or less pyramidal)
   3 Globular
   4 Rounded

49. **Mature seed colour**
   To be recorded on ripe fruit
   1 Brown
   2 Black

50. **Productivity status**
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

51. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   
   **Note**: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

52. **Biotic notes**
   Text

53. **Remarks**
   Text
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

Ber (Zizyphus mauritiana Lamk.)
Hindi: Ber

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Layered
   3. Cutting
   4. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Rootstock used
   1. Seedling
   99. Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   To be measured from ground level to the tip of the highest shoot
   Quantitative

4. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

5. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period
   Quantitative

6. Tree habit
   1. Bushy
   3. Upright
   5. Intermediate
   7. Spreading
   9. Drooping
7. **Foliage density**
To be recorded just before flowering

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Sparse</td>
</tr>
<tr>
<td>5</td>
<td>Medium dense</td>
</tr>
<tr>
<td>7</td>
<td>Dense</td>
</tr>
</tbody>
</table>

8. **Branch thorniness**
To be recorded during flowering

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Less</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

9. **Thorn shape**
To be recorded during flowering

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All curved</td>
</tr>
<tr>
<td>2</td>
<td>Alternate curved</td>
</tr>
<tr>
<td>3</td>
<td>All straight</td>
</tr>
</tbody>
</table>

10. **Leaf shape**
To be recorded on mature leaf

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ovate</td>
</tr>
<tr>
<td>2</td>
<td>Obovate</td>
</tr>
<tr>
<td>3</td>
<td>Ovate oblong</td>
</tr>
<tr>
<td>4</td>
<td>Cordate</td>
</tr>
<tr>
<td>5</td>
<td>Oval</td>
</tr>
<tr>
<td>6</td>
<td>Elliptic</td>
</tr>
<tr>
<td>7</td>
<td>Broad elliptic</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

11. **Leaf apex**
To be recorded on mature leaf

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Round</td>
</tr>
<tr>
<td>2</td>
<td>Obtuse</td>
</tr>
<tr>
<td>3</td>
<td>Acute</td>
</tr>
<tr>
<td>4</td>
<td>Sub-acute</td>
</tr>
<tr>
<td>5</td>
<td>Mucronate</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

12. **Leaf margin**
To be recorded on mature leaf

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entire</td>
</tr>
<tr>
<td>2</td>
<td>Serrate</td>
</tr>
<tr>
<td>3</td>
<td>Serrulate</td>
</tr>
<tr>
<td>4</td>
<td>Undulate (wavy)</td>
</tr>
</tbody>
</table>
13. **Leaf pubescence on lower surface**  
   To be recorded on mature leaf  
   0  Absent  
   3  Smooth  
   5  Sparsely tomentose  
   7  Densely tomentose  

14. **Leaf pubescence on upper surface**  
   To be recorded on mature leaf  
   0  Absent  
   3  Smooth  
   5  Sparsely tomentose  
   7  Densely tomentose  

15. **Position of flower buds**  
   To be recorded during flowering  
   1  In the leaf axil of mature shoot  
   2  In the leaf axil of the current season shoot  
   3  Both  

16. **Self incompatibility**  
   To be recorded during flowering  
   0  No  
   1  Yes  

17. **Date of start of flowering (dd/mm/yyyy)**  
   To be recorded when 5% flower buds have opened  
   Date  

18. **Date of end of flowering (dd/mm/yyyy)**  
   To be recorded when 85-90% flower buds have opened  
   Date  

19. **Flower intensity of shoot**  
   To be recorded during flowering  
   1  Maximum on middle of the shoot  
   2  Maximum on middle to upper part of the shoot  
   3  Scattered from basal to upper part of the shoot  

20. **Bearing habit**  
   To be recorded after fruit set  
   1  Solitary  
   2  Cluster
21. **Number of fruits per cluster**  
   To be recorded as average of 5 random clusters  
   Quantitative

22. **Date of 50% fruit maturity (dd/mm/yyyy)**  
   To be recorded when at least 50% fruits mature  
   Date

23. **Fruit maturity group**  
   To be recorded at the time of harvest  
   1 Very early  
   3 Early  
   5 Mid  
   7 Late

24. **Fruit shape**  
   To be recorded on mature fruit  
   1 Round  
   2 Ovate oblong  
   3 Obovate  
   4 Oblong oval  
   5 Oblong  
   6 Oval  
   7 Oblate  
   8 Elliptic  
   99 Others (Specify in the 'Remarks' descriptor)

25. **Fruit cracking**  
   To be recorded at the time of harvest  
   0 Absent  
   1 Present

26. **Immature fruit colour**  
   To be recorded on immature fruit  
   1 Light green  
   2 Green  
   3 Dark green  
   4 Green with purplish blush  
   5 Purple  
   6 Maroon  
   99 Others (Specify in the 'Remarks' descriptor)
### 27. Mature fruit colour
To be recorded on mature fruit

<table>
<thead>
<tr>
<th></th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yellow</td>
</tr>
<tr>
<td>2</td>
<td>Golden yellow</td>
</tr>
<tr>
<td>3</td>
<td>Greenish yellow</td>
</tr>
<tr>
<td>4</td>
<td>Pinkish yellow</td>
</tr>
<tr>
<td>5</td>
<td>Golden</td>
</tr>
<tr>
<td>6</td>
<td>Green</td>
</tr>
<tr>
<td>7</td>
<td>Chocolate brown</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the ‘Remarks’ descriptor)</td>
</tr>
</tbody>
</table>

### 28. Fruit surface
To be recorded on mature fruit

<table>
<thead>
<tr>
<th></th>
<th>Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smooth</td>
</tr>
<tr>
<td>2</td>
<td>Glossy</td>
</tr>
<tr>
<td>3</td>
<td>Ridged</td>
</tr>
<tr>
<td>4</td>
<td>Bumpy</td>
</tr>
</tbody>
</table>

### 29. Fruit apex
To be recorded at stylar end of mature fruit

<table>
<thead>
<tr>
<th></th>
<th>Apex</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Round</td>
</tr>
<tr>
<td>2</td>
<td>Broad</td>
</tr>
<tr>
<td>3</td>
<td>Depressed</td>
</tr>
<tr>
<td>4</td>
<td>Beaked</td>
</tr>
<tr>
<td>5</td>
<td>Broadly pointed</td>
</tr>
<tr>
<td>6</td>
<td>Nippled</td>
</tr>
<tr>
<td>7</td>
<td>Pointed</td>
</tr>
</tbody>
</table>

### 30. Fruit base
To be recorded on mature fruit

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Round</td>
</tr>
<tr>
<td>2</td>
<td>Broad</td>
</tr>
<tr>
<td>3</td>
<td>Flat</td>
</tr>
<tr>
<td>4</td>
<td>Depressed shallow</td>
</tr>
<tr>
<td>5</td>
<td>Narrow pointed</td>
</tr>
<tr>
<td>6</td>
<td>Nippled</td>
</tr>
<tr>
<td>7</td>
<td>Grooved</td>
</tr>
</tbody>
</table>

### 31. Pulp colour
To be recorded on mature fruit

<table>
<thead>
<tr>
<th></th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Creamy white</td>
</tr>
<tr>
<td>2</td>
<td>Light yellow</td>
</tr>
<tr>
<td>3</td>
<td>Greenish white</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the ‘Remarks’ descriptor)</td>
</tr>
</tbody>
</table>
32. **Pulp texture**
To be recorded on mature fruit

1. Soft
2. Medium
3. Granular
4. Firm

33. **Fruit length (mm)**
To be recorded as average of 10 random mature fruits

Quantitative

34. **Fruit width (mm)**
To be recorded as average of same 10 fruits

Quantitative

35. **Fruit weight (g)**
To be recorded as average of same 10 fruits

Quantitative

36. **Pulp taste**
To be recorded on mature fruit

1. Acidic
2. Sub-acidic
3. Sweet
4. Highly sweet

37. **Pulp aroma**
To be recorded on mature fruit

1. Mild
2. Moderate
3. Strong

38. **Total soluble solids (%)**
To be measured with refractometer

Quantitative

39. **Stone apex**
To be recorded on mature fruit

1. Obluse (round)
2. Apiculate (pointed)
3. Acute
40. **Stone shape**
   To be recorded on mature fruits
   
   1. Round
   2. Oblong oval
   3. Sub-globose
   4. Oblong
   5. Oval
   6. Elliptic
   7. Spindle
   8. Pyriform
   99. Others (Specify in the ‘Remarks’ descriptor)

41. **Stone base**
   To be recorded on mature fruit
   
   1. Obtuse (round)
   2. Apiculate (pointed)
   3. Acute

42. **Stone surface**
   To be recorded on mature fruit
   
   1. Smooth
   2. Warty
   3. Furrowed

43. **Stone length (mm)**
   To be recorded as average of stones of same 10 fruits
   
   Quantitative

44. **Stone width (mm)**
   To be recorded as average of same 10 stones
   
   Quantitative

45. **Stone weight (g)**
   To be recorded as average of same 10 stones
   
   Quantitative

46. **Pulp-stone ratio**
   To be calculated on the basis of fruit weight and stone weight of same 10 fruits
   
   Quantitative

47. **Productivity status**
   To be recorded at the time of harvest
   
   3. Low
   5. Medium
   7. High
48. Biotic Stress Susceptibility
   Specify the infestation or infection using 1-9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and
   causal organism(s) may be appended in the Biotic notes descriptor.

   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

49. Biotic notes
   Text

50. Remarks
   Text
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

Carambola (Averrhoa carambola L.)
Hindi : Kamrakh

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   4. Grafted
   99. Others (Specify in the 'Remarks' descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of highest shoot
   Quantitative

3. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. Tree spread (m)
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

5. Tree habit
   3. Upright
   5. Spreading
   7. Drooping

6. Leaf size
   To be recorded on mature leaf
   3. Small
   5. Medium
   7. Large

7. Number of leaflets
   To be recorded in between 5th and 11th leaf
   Quantitative
8. **Leaflet shape**  
To be recorded on mature leaflet  
1. Ovate  
2. Oblong  
3. Ovate-oblong  
99. Others (Specify in the 'Remarks' descriptor)

9. **Inflorescence position**  
To be recorded during flowering  
1. Short axillary racemes  
2. Panicles arising from old wood  
3. Panicles on main stem  
4. All over the plant

10. **Panicle type**  
To be recorded during flowering  
1. Simple panicle  
2. Double (cluster panicle)  
3. Triple (cluster panicle)

11. **Main flowering season**  
1. April - May  
2. July - August  
3. September - October  
4. Throughout the year

12. **Flowering habit**  
To be recorded as number of flushes in a year  
1. Once  
2. Twice  
3. Thrice

13. **Date of start of flowering (dd/mm/yyyy)**  
To be recorded when 5% flower buds have opened  
Date

14. **Date of end of flowering (dd/mm/yyyy)**  
To be recorded when 85-90% flower buds have opened  
Date

15. **Flower type**  
To be recorded as style length in relation to stamen length  
1. Long style or pin eye flowers (stigma located above the stamen)  
2. Short style or thrum eye flowers (stigma located below the stamen)
16. Petal colour
To be recorded on just opened flower

1  Dull white
2  White
3  Rose pink
4  Purple
99 Others (Specify in the 'Remarks' descriptor)

17. Main panicle stalk colour
To be recorded during flowering

1  Greenish having light pinkish branches
2  Dark purple having purplish branches
99 Others (Specify in the 'Remarks' descriptor)

18. Fruit shape
To be recorded on mature fruit

1  Ovoid
2  Oblong
3  Ellipsoid
99 Others (Specify in the 'Remarks' descriptor)

19. Fruit length (cm)
To be recorded as average of 10 random mature fruits
Quantitative

20. Fruit width (cm)
To be recorded as average of same 10 fruits through transverse cross section
Quantitative

21. Fruit weight (g)
To be recorded as average of same 10 fruits
Quantitative

22. Ripe fruit colour
To be recorded on ripe but not on over ripe fruit

1  Lemon yellow
2  Deep yellow with orange tint
3  Light green
4  Deep green
99 Others (Specify in the 'Remarks' descriptor)
23. **Fruit wing edges**
   To be recorded on mature fruit
   1  Slightly rounded
   2  Rounded
   3  Moderately sharp
   4  Sharp

24. **Fruit wing numbers**
   To be recorded as average of same 10 fruits
   Quantitative

25. **Pulp texture**
   To be recorded on ripe fruit
   3  Soft
   5  Crisp
   7  Firm

26. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

27. **Fruit aroma**
   To be recorded on ripe fruit
   3  Mild
   5  Moderate
   7  Strong

28. **Juiciness**
   To be recorded on ripe fruit
   3  Low
   5  Medium
   7  High

29. **Fruit acidity**
   To be recorded on ripe fruit
   3  Low
   5  Medium
   7  High

30. **Number of seeds per fruit**
   To be recorded as average of same 10 fruits
   Quantitative
31. **Seed colour**
   To be recorded on mature fruit

   1. Light yellow
   2. Yellow
   3. Light brown
   99. Others (Specify in the ‘Remarks’ descriptor)

32. **Productivity status**
   To be recorded at the time of harvest

   3. Low
   5. Medium
   7. High

33. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   
   Note: For additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

   1. Very low or no visible sign of susceptibility
   3. Low
   5. Intermediate
   7. High
   9. Very high

34. **Biotic notes**
   Text

35. **Remarks**
   Text
Cashew (Anacardium occidentale L.)
Hindi : Kaju

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 10th year of planting with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Grafted
   3. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of the highest shoot during flowering stage
   3. Dwarf (< 2.5)
   5. Semi tall (2.5 - 4.0)
   7. Tall (> 4.0)

3. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions) during flowering stage
   3. Low (< 3.0)
   5. Intermediate (3.0 - 6.0)
   7. High (> 6.0)

4. Tree habit
   To be recorded during flowering stage
   3. Upright and compact
   5. Upright and open
   7. Spreading
   99. Others (Specify in the 'Remarks' descriptor)

5. Internode length (cm)
   To be recorded after three months of flushing
   3. Short (< 1.0)
   5. Medium (1.0 - 2.0)
   7. Long (> 2.0)
6. **Leaf shape**  
   To be recorded of fully expanded leaves after three months of flushing
   
   1. Oblong
   2. Obovate (clubbed shaped)
   3. Oval
   99. Others (Specify in the 'Remarks' descriptor)

   ![Leaf Shapes](image_url)

   1. Oblong  
   2. Obovate  
   3. Oval

   **Leaf shape**

7. **Young leaf colour**  
   To be recorded after three months of flushing
   
   1. Red
   2. Yellow red
   3. Green yellow
   4. Purple

8. **Mature leaf colour**  
   To be recorded after three months of flushing
   
   1. Light green
   2. Green
   3. Dark green
   4. Purple

9. **Leaf apex shape**  
   To be recorded after three months of flushing
   
   1. Pointed (Apiculate)
   2. Rounded (Obtuse)
   3. Indented (Slight notch)
   99. Others (Specify in the 'Remarks' descriptor)
10. **Leaf brittleness**  
To be recorded after three months of flushing

- **3** Non brittle
- **5** Medium brittle
- **7** Brittle

11. **Date of start of flowering (dd/mm/yyyy)**  
To be recorded when 5% panicles have open flower

Date

12. **Date of end of flowering (dd/mm/yyyy)**  
To be recorded when 85-90% flower buds have opened

Date

13. **Season of flowering**  
To be recorded when 50% panicles have open flower

- **3** Early (Nov - Dec)
- **5** Mid (Dec - Jan)
- **7** Late (Jan - Feb)

14. **Inflorescence shape**  
To be recorded after one month of flowering

- **3** Narrowly pyramidal (Conical)
- **5** Pyramidal (Deltoid)
- **7** Broadly pyramidal
- **99** Others (Specify in the ‘Remarks’ descriptor)

15. **Petal colour**  
To be recorded during flowering

- **1** White
- **2** Cream
- **3** Pink
- **99** Others (Specify in the ‘Remarks’ descriptor)
16. Sex ratio (hermaphrodite: total number of flowers)
   To be recorded during full flowering
   
   3 Low (< 0.06)
   5 Medium (0.06 - 0.13)
   7 High (> 0.13)

17. Mature cashew apple skin colour
   To be recorded at peak harvesting stage
   
   1 Yellow
   2 Red
   3 Yellow red
   4 Red purple
   99 Others (Specify in the 'Remarks' descriptor)

18. Cashew apple shape
    To be recorded at peak harvesting stage

   1 Cylindrical
   2 Conical obovate
   3 Round
   4 Pyriform

   ![Cashew Apple Shapes]

   1 Cylindrical  2 Conical obovate  3 Round  4 Pyriform

   Cashew apple shape

19. Cashew apple weight (g)
    To be recorded as average of 5 random cashew apples at peak harvesting stage

   3 Low (< 27)
   5 Medium (27- 52)
   7 High (> 52)
20. **Cashew apple surface**
   To be recorded at peak harvesting stage
   1 Smooth and glossy
   2 Rough and dull
   99 Others (Specify in the 'Remarks' descriptor)

21. **Total soluble solids (%)**
   To be measured with refractometer on cashew apple
   Quantitative

22. **Attachment of nut to cashew apple**
   To be recorded at peak harvesting stage
   3 Loose
   5 Intermediate
   7 Tight

23. **Nut length (mm)**
   To be recorded as average of 10 random nuts
   Quantitative

24. **Nut width (mm)**
   To be recorded as average of same 10 nuts
   Quantitative

25. **Nut weight (g)**
   To be recorded as average of same 10 nuts
   3 Low (< 5.0)
   5 Intermediate (5.0 - 7.0)
   7 High (> 7.0)

26. **Nut base shape**
   To be recorded on mature nut
   1 Round
   2 Flattened
   3 Obliquely flattened
   4 Angular

27. **Nut shape**
   To be recorded on mature nut
   1 Kidney shaped
   2 Oblong - ellipsoid
28. **Nut flanks**
   To be recorded on mature nut
   3 Flattened
   5 Rounded
   7 Bulging

29. **Stylar scar on nut**
   To be recorded on mature nut
   1 Small (narrow)
   2 Large (wide)

30. **Shell thickness (mm)**
    To be recorded on mature nut
    3 Thin (< 2.5)
    5 Intermediate (2.5 - 4.0)
    7 Thick (> 4.0)

31. **Kernel length (mm)**
    To be recorded as average of kernel of same 10 nuts
    Quantitative
32. **Kernel width (mm)**
   To be recorded as average of same 10 kernels
   Quantitative

33. **Kernel weight (g)**
   To be recorded as average of same 10 kernels
   - 3 Low (< 1.2)
   - 5 Intermediate (1.2 - 2.5)
   - 7 High (> 2.5)

34. **Cotyledonary groove**
   To be recorded on mature kernel
   - 3 Shallow
   - 5 Intermediate
   - 7 Deep

35. **Shelling percentage**
   To be calculated on the basis of kernel and nut weight
   - 3 Low (< 18.0%)
   - 5 Intermediate (18.0 - 28.0%)
   - 7 High (> 28.0%)

36. **Productivity status (Kg)**
   To be recorded as average of plant yield for six cumulative annual harvest
   - 3 Low (< 9.0)
   - 5 Medium (9.0 - 18.0)
   - 7 High (> 18.0)

37. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   - 1 Very low or no visible sign of susceptibility
   - 3 Low
   - 5 Intermediate
   - 7 High
   - 9 Very high

38. **Biotic notes**
   Text

39. **Remarks**
   Text
Citrus (*Citrus* species)

**Hindi:** Nimbu, Santara, Mosambi, Chakotra etc.

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   4. Grafted
   5. Budded
   99 Others (Specify in the 'Remarks' descriptor)

2. **Rootstock used**
   1. Sweet lime
   2. Rough lemon
   3. Rangpur lime
   4. Karna khatta
   5. Cleopatra mandarin
   6. Trifoliate orange
   99 Others (Specify in the 'Remarks' descriptor)

3. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

4. **Trunk girth (cm)**
   To be measured at 20 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

5. **Trunk - rootstock diameter ratio**
   1. Smaller (<1.0)
   2. Same (1.0)
   3. Larger (>1.0)

6. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative
7. **Tree habit**
   - Upright
   - Spreading
   - Compact
   - Drooping

8. **Tree shape**
   - Ellipsoid
   - Spheroid
   - Ellipsoid-oblate
   - Others (Specify in the 'Remarks' descriptor)

9. **Branch density**
   - Sparse
   - Medium
   - Dense

10. **Leaf type**
    To be recorded on mature leaf
    - Trifoliate
    - Simple

11. **Leaf persistency**
    - Evergreen
    - Deciduous
    - Semi persistent

12. **Leaf form**
    To be recorded as length of the petiole relative to length of leaf lamina
    - Sessile (petiole absent)
    - Brevipetiolate (petiole shorter than leaf lamina)
    - Longipetiolate (petiole longer than lamina or of equal length)
13. Petiole wing shape
To be recorded on mature leaf
1  Cordiform
2  Deltoid
3  Obovate
99  Others (Specify in the 'Remarks' descriptor)

1 Cordiform  2 Deltoid  3 Obovate

Petiole wing shape

14. Leaf or leaflet shape
To be recorded on mature leaf
1  Elliptic
2  Ovate
3  Obovate
4  Lanceolate
5  Orbicular
99  Others (Specify in the 'Remarks' descriptor)

1 Elliptic  2 Ovate  3 Obovate  4 Lanceolate  5 Orbicular

Leaf or leaflet shape
15. **Leaf length (cm)**
   To be recorded as average of 10 random mature leaves (including petiole)
   
   Quantitative

16. **Leaf width (cm)**
   To be recorded as average of same 10 leaves
   
   Quantitative

17. **Leaf margin**
   To be recorded on mature leaf
   
   1. Crenate
   2. Dentate
   3. Entire
   4. Wavy
   99. Others (Specify in the 'Remarks' descriptor)

   ![Leaf margin illustrations](image)

   1 Crenate 2 Dentate 3 Entire 4 Wavy

18. **Flower type**
   To be recorded at flowering stage
   
   1. Hermaphrodite
   2. Male
   3. Female
   99. Others (Specify in the 'Remarks' descriptor)

19. **Arrangement of flowers**
   To be recorded during flowering
   
   1. Solitary
   2. In an inflorescence
   3. Both
20. Inflorescence position
   To be recorded during flowering
   1  Axillary
   2  Terminal
   3  Both

21. Number of flower buds per inflorescence
   To be recorded as average of 10 random inflorescences
   Quantitative

22. Date of start of flowering (dd/mm/yyyy)
   To be recorded when 5% flower buds have opened
   Date

23. Date of end of flowering (dd/mm/yyyy)
   To be recorded when 85-90% flower buds have opened
   Date

24. Bud colour
   To be recorded just before flowering
   1  White
   2  Yellow
   3  Green
   4  Pink
   99  Others (Specify in the 'Remarks' descriptor)

25. Petal colour
   To be recorded just after flowering
   1  White
   2  Yellow
   3  Purple
   99  Others (Specify in the 'Remarks' descriptor)

26. Number of petals per flower
   To be recorded as average of 10 random flowers
   Quantitative

27. Date of fruit maturity (dd/mm/yyyy)
   To be recorded when 50% fruits attain maturity
   Date

28. Number of fruits per tree
   To be recorded as average of 3 random trees
   Quantitative
29. **Fruit shape**  
To be recorded on mature fruit

1. Spheroid  
2. Ellipsoid  
3. Pyriform  
4. Oblique  
5. Oblate  
6. Ovoid-oblique  
7. Ovoid  
99. Others (Specify in the 'Remarks' descriptor)

![Fruit shape](image)

1. Spheroid  
2. Ellipsoid  
3. Pyriform  
4. Oblique  
5. Oblate  
6. Ovoid-oblique  
7. Ovoid

**Fruit shape**

30. **Fruit base shape**  
To be recorded on mature fruit

1. Necked  
2. Convex  
3. Truncate  
4. Concave  
5. Concave collared  
6. Collared with neck  
99. Others (Specify in the 'Remarks' descriptor)
31. **Fruit apex shape**

To be recorded on mature fruit

1. Mammiform
2. Angular
3. Convex
4. Truncate
5. Depressed
99. Others (Specify in the ‘Remarks’ descriptor)

---

**Fruit base shape**
32. **Fruit skin colour**  
To be recorded on mature fruit

1. Yellow  
2. Green  
3. Orange  
99. Others (Specify in the 'Remarks' descriptor)

33. **Fruit skin surface**  
To be recorded on mature fruit

1. Smooth  
2. Rugose  
3. Papillate  
4. Pitted  
5. Bumpy  
6. Longitudinal grooved and ridges  
7. Hairy

34. **Adherence of epicarp to mesocarp**  
To be recorded on mature fruit

3. Slight  
5. Moderate  
7. Strong

35. **Nature of oil glands**  
To be recorded on mature fruit

1. Inconspicuous  
2. Conspicuous  
3. Very conspicuous

36. **Number of oil glands**  
To be recorded as number of glands per square centimeter on fruit surface

Quantitative

37. **Mesocarp colour**  
To be recorded on mature fruits

1. White  
2. Yellow  
99. Others (Specify in the 'Remarks' descriptor)

38. **Number of fruit segments**  
To be recorded as average of 5 random fruits

Quantitative
39. **Adherence of segments to each other**
   To be recorded on mature fruit
   
   | 3 | Slight |
   | 5 | Moderate |
   | 7 | Strong |

40. **Fruit length (cm)**
   To be recorded as average of same 5 fruits
   Quantitative

41. **Fruit width (cm)**
   To be recorded as average of same 5 fruits
   Quantitative

42. **Fruit weight (g)**
   To be recorded as average of same 5 fruits
   Quantitative

43. **Number of fruits per cluster**
   To be recorded as average of 5 random clusters
   Quantitative

44. **Attachment of fruit to tree**
   To be recorded on mature fruit
   
   | 3 | Weak |
   | 5 | Medium |
   | 7 | Strong |

45. **Pulp colour**
   To be recorded on mature fruit
   
   | 1 | Yellow |
   | 2 | Green |
   | 3 | Orange |
   | 4 | Pink |
   | 5 | Red |
   | 99 | Others (Specify in the ‘Remarks’ descriptor) |

46. **Pulp texture**
   To be recorded on mature fruit
   
   | 3 | Tender |
   | 5 | Firm |
   | 7 | Tough |
47. **Juice content**
   To be measured as volume (ml) per weight (g) basis
   Quantitative

48. **Juice colour**
   To be recorded on mature fruit
   1 White
   2 Pale yellow
   3 Yellow
   4 Greenish
   5 Orange
   6 Reddish
   99 Others (Specify in the 'Remarks' descriptor)

49. **Juice taste**
   To be recorded on mature fruit
   1 Very poor
   3 Poor
   5 Fair
   7 Good
   9 Excellent

50. **Juice aroma**
   To be recorded on mature fruit
   3 Mild
   5 Moderate
   7 Strong

51. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

52. **Fruit acidity (%)**
   To be recorded on mature fruit
   Quantitative

53. **Number of seeds per fruit**
   To be recorded as average of same 5 fruits
   Quantitative

54. **Seed length (mm)**
   To be recorded as average of 20 random seeds
   Quantitative
55. Seed width (mm)
To be recorded as average of same 20 seeds
Quantitative

56. Seed weight (g)
To be recorded as average of same 20 seeds
Quantitative

57. Seed shape
To be recorded on mature fruit

1  Fusiform
2  Clavate
3  Cuneiform
4  Ovoid
5  Deltoid
6  Globose
7  Semi-spheroid
99  Others (Specify in the 'Remarks' descriptor)

Seed shape
58. **Seed colour**
   To be recorded on mature fruit
   1. Cream
   2. Yellow
   3. Green
   5. Brown
   99. Others (Specify in the 'Remarks' descriptor)

59. **Productivity status**
   To be recorded at the time of harvest
   3. Low
   5. Medium
   7. High

60. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
   1. Very low or no visible sign of susceptibility
   3. Low
   5. Intermediate
   7. High
   9. Very high

61. **Biotic notes**
   Text

62. **Remarks**
   Text
Coconut (*Cocos nucifera* L.)

**Hindi**: Nariyal

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   - 1 Seed
   - 99 Others (Specify in the 'Remarks' descriptor)

2. **Tree height (m)**
   - To be measured from ground level to the oldest green leaf
   - Quantitative

3. **Trunk girth (cm)**
   - To be measured at 1.5 m above the ground level
   - Quantitative

4. **Tree spread (m)**
   - To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period
   - Quantitative

5. **Tree habit**
   - 1 Erect
   - 2 Angled
   - 3 Bowed
   - 4 Curved

6. **Bole category**
   - 0 No bole
   - 3 Low
   - 7 High

7. **Crown shape**
   - 1 Spherical
   - 2 Hemispherical
   - 3 X-shaped 'silhouette'
   - 4 V-shaped
   - 99 Others (Specify in the 'Remarks' descriptor)
1 Erect

2 Angled

3 Bowed

4 Curved

Tree habit

0 No bole

3 Low

7 High

Bole category
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

8. Number of green leaves
   To be recorded as average of 3 random trees at first fruiting stage
   Quantitative

9. Leaf petiole colour
   To be recorded on first fruiting stage
   1   Yellow
   2   Green
   3   Red
   4   Brown
   99  Others (Specify in the 'Remarks' descriptor)
10. **Petiole length (cm)**
   To be recorded as average of 5 random leaves from base to the most proximal leaflet
   Quantitative

11. **Petiole thickness (cm)**
   To be recorded as average of same 5 leaves at the insertion of first leaflet
   Quantitative

12. **Number of leaflets per leaf**
   To be recorded as average of same 5 leaves
   Quantitative

13. **Number of leaves produced in one year**
   To be recorded as average of 3 random trees
   Quantitative

14. **Inflorescence type**
   1  Normal
   2  Spicata (full or partial)
   3  Androgena
   4  Additional spathes or bracts
   99  Others (Specify in the 'Remarks' descriptor)

15. **Female flower colour**
   To be recorded during flowering
   1  White
   2  Cream
   3  Yellow
   99  Others (Specify in the 'Remarks' descriptor)

16. **Male flower colour**
   To be recorded during flowering
   1  Cream
   2  Light brown
   3  Brown pink
   99  Others (Specify in the 'Remarks' descriptor)

17. **Number of spikelets with female flowers**
   To be recorded as average of 3 random spikelets
   Quantitative
18. Spikelet length (cm)
   To be recorded as average of 5 random spikelets
   Quantitative

19. Number of female flowers per spikelets
   To be recorded as average of 5 random spikelets. Can be counted from scars if flowers have been shed
   Quantitative

20. Date of first fruit maturity (dd/mm/yyyy)
   To be recorded when at least one fruit on a bunch is changing from the fresh to the dry colour with some fresh remaining, at least on the calyx
   Date

21. Fruit shape
   To be recorded on mature fruit
   1  Round
   2  Ovoid
   3  Oblong
   4  Angled
   99  Others (Specify in the 'Remarks' descriptor)

22. Fruit length (cm)
   To be recorded as average of 5 random fruits with husk
   Quantitative

23. Fruit width (cm)
   To be recorded as average of same 5 fruits with husk
   Quantitative

24. Fruit weight (g)
   To be recorded as average of same 5 fruits with husk
   Quantitative
25. Nut shape
   1  Pointed
   2  Ovoid
   3  Almost round
   4  Oblate
   99 Others (Specify in the 'Remarks' descriptor)

Nut shape

26. Nut length (cm)
    To be recorded as average of nuts of same 5 fruits without husk
    Quantitative

27. Nut width (cm)
    To be recorded as average of same 5 fruits without husk
    Quantitative

28. Nut weight (g)
    To be recorded as average of same 5 fruits without husk
    Quantitative

29. Shell weight (g)
    To be recorded as average of shells of same 5 nuts without meat and water
    Quantitative

30. Meat weight (g)
    To be recorded as average of same 5 nuts without shell and water
    Quantitative

31. Coconut water weight (g)
    To be recorded as average of same 5 nuts without shell and meat
    Quantitative

32. Endosperm thickness (mm)
    To be recorded as average of same 5 nuts at nuts equator
    Quantitative
33. **Solid endosperm dry matter content (%)**
   To be recorded by drying at 105°C until mass is constant
   Quantitative

34. **Copra weight per nut (g)**
   To be calculated as 106% on the dry endosperm mass divided by 0.94
   Quantitative

35. **Copra yield /palm/year (kg)**
   To be recorded as average of 3 palms
   Quantitative

36. **Dry meat oil content (%)**
   To be recorded as weight of oil extracted/total dry weight of the sample x 100 (Soxhlet method)
   Quantitative

37. **Fibre length (mm)**
   To be recorded as average of 20 random fibres each separated manually from husk
   Quantitative

38. **Productivity status**
   To be recorded at the time of harvest
   
<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
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<td>7</td>
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</tbody>
</table>

39. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
<table>
<thead>
<tr>
<th></th>
<th>Very low or no visible sign of susceptibility</th>
<th>Low</th>
<th>Intermediate</th>
<th>High</th>
<th>Very high</th>
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</tbody>
</table>

40. **Biotic notes**
   Text

41. **Remarks**
   Text
**Custard apple (Annona species)**

**Hindi : Sharifa, Ramphal etc.**

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Type of planting material</td>
<td>To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible</td>
</tr>
<tr>
<td></td>
<td>1. Seedling</td>
</tr>
<tr>
<td></td>
<td>2. Cutting</td>
</tr>
<tr>
<td></td>
<td>3. Grafted</td>
</tr>
<tr>
<td></td>
<td>99. Others (Specify in the ‘Remarks’ descriptor)</td>
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<tr>
<td>2. Root stock used</td>
<td></td>
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<td></td>
<td>1. Own seedling</td>
</tr>
<tr>
<td></td>
<td>2. Seedling of related species</td>
</tr>
<tr>
<td>3. Tree height (m)</td>
<td>To be measured from ground level to the tip of the highest shoot</td>
</tr>
<tr>
<td></td>
<td>Quantitative</td>
</tr>
<tr>
<td>4. Trunk girth (cm)</td>
<td>To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones.</td>
</tr>
<tr>
<td></td>
<td>Quantitative</td>
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<tr>
<td>5. Tree spread (m)</td>
<td>To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period</td>
</tr>
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<td>Quantitative</td>
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<tr>
<td>6. Tree habit</td>
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<tr>
<td></td>
<td>1. Semi-spreading</td>
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<td>2. Spreading</td>
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<td>3. Drooping</td>
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<td>7. Tree nature</td>
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<td></td>
<td>1. Evergreen</td>
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<td></td>
<td>2. Semi deciduous</td>
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<tr>
<td></td>
<td>3. Deciduous</td>
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</tbody>
</table>
8. Foliage density
   3 Low
   5 Medium
   7 High

9. Leaf shape
   To be recorded on mature leaf
   1 Oblong
   2 Oblong elliptic
   3 Lanceolate
   4 Oval lanceolate
   99 Others (Specify in the 'Remarks' descriptor)

10. Dots on leaf
    To be recorded on mature leaf
    0 Absent
    1 Present

11. Leaf pubescence
    To be recorded on mature leaf
    3 Sparse
    5 Medium
    7 Dense

12. Date of start of flowering (dd/mm/yyyy)
    To be recorded when 5% flower buds have opened
    Date

13. Date of end of flowering (dd/mm/yyyy)
    To be recorded when 85-90% flower buds have opened
    Date

14. Inflorescence position
    To be recorded during flowering
    1 On current shoot
    2 On old shoot
    3 Both

15. Flower bunch
    To be recorded during flowering
    1 Solitary
    2 Clustered
16. **Petal colour**
   To be recorded just after flowering
   1. Greenish
   2. Greenish purple
   3. Purple
   99. Others (Specify in the 'Remarks' descriptor)

17. **Date of 50% fruit maturity (dd/mm/yyyy)**
   To be recorded when at least 50% fruits in a plant attains maturity
   
   Date

18. **Fruit length (cm)**
   To be recorded as average of 5 random fruits
   Quantitative

19. **Fruit width (cm)**
   To be recorded as average of same 5 fruits
   Quantitative

20. **Fruit weight (g)**
   To be recorded as average of same 5 fruits
   Quantitative

21. **Fruit skin surface**
   To be recorded on mature fruit
   1. Smooth
   2. Tubercled

22. **Fruit skin colour**
   To be recorded on ripe fruit but not on over ripe fruit
   1. Pale yellow
   2. Greenish yellow
   3. Green
   4. Pink
   5. Dark pink
   6. Brownish
   99. Others (Specify in the 'Remarks' descriptor)

23. **Areole shape**
   To be recorded on mature fruit
   1. Tuberculate
   2. Semi tuberculate
   3. Round
24. Areole distinctiveness
To be recorded on mature fruit
3 Shallow
5 Medium
7 Deep

25. Areole surface
To be recorded on mature fruit
1 Very smooth
2 Smooth
3 Slightly rough
4 Rough
5 Very rough
6 Rough and pitted
7 Ridged

26. Fruit pedicel length (cm)
To be recorded as average of same 5 fruits
Quantitative

27. Pedicel surface
To be recorded on mature fruit pedicel
1 Smooth
2 Rough
3 Warty

28. Pedicel thickness
To be recorded on mature fruit pedicel
3 Thin
5 Medium thick
7 Thick

29. Fruit shape
To be recorded on mature fruit
1 Spherical
2 Globose
3 Oblong conical
4 Cordate

30. Adherence of flakes to seed
To be recorded on ripe fruit
3 Weak
5 Moderate
7 Strong
31. Pulp colour
   To be recorded on ripe fruit
   1. White
   2. Dull white
   3. Creamy white
   4. Pinkish
   5. Red
   99. Others (Specify in the 'Remarks' descriptor)

32. Pulp texture
   To be recorded on ripe fruit
   1. Soft
   2. Leathery
   3. Granular

33. Pulp taste
   To be recorded on ripe fruit
   1. Insipid
   2. Moderately acidic
   3. Sweet
   4. Very sweet

34. Total soluble solids (%)
   To be measured with refractometer
   Quantitative

35. Seed length (mm)
   To be recorded as average of 10 random seeds
   Quantitative

36. Seed width (mm)
   To be recorded as average of same 10 seeds
   Quantitative

37. Seed weight (g)
   To be recorded as average of same 10 seeds
   Quantitative

38. Number of seeds per fruit
   To be recorded as average of same 5 fruits
   Quantitative
39. Seed colour
   To be recorded on ripe fruit
   1 Brown
   2 Dark brown
   3 Black
   99 Others (Specify in the 'Remarks' descriptor)

40. Seed shape
   To be recorded on ripe fruit
   1 Oblong
   2 Obliquely truncated
   99 Others (Specify in the 'Remarks' descriptor)

41. Fruit cracking (%)
   Quantitative

42. Productivity status
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

43. Biotic Stress Susceptibility
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

44. Biotic notes
   Text

45. Remarks
   Text
Date palm (*Phoenix dactylifera* L.)

**Hindi:** Khajoor

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Offshoot

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest leaf
   Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period
   Quantitative

5. **Number of offshoots near the base**
   To be recorded as cumulative average of 5 random trees till 3rd year of bearing
   Quantitative

6. **Number of aerial offshoots**
   To be recorded as cumulative average of same 5 trees till 3rd year of bearing
   Quantitative

7. **Leaf length (m) including petiole**
   To be recorded as average of 10 random mature leaves
   Quantitative

8. **Leaflet midrib length (cm)**
   To be recorded as average of 10 random central leaflets from same 10 leaves
   Quantitative
9. **Leaf colour**
   To be recorded on mature leaf
   1 Light green
   2 Green
   3 Greyish green
   99 Others (Specify in the 'Remarks' descriptor)

10. **Date of female spathe emergence (dd/mm/yyyy)**
    To be recorded as the date of first female spathe emergence
    Date

11. **Date of male spathe emergence (dd/mm/yyyy)**
    To be recorded as the date of first male spathe emergence
    Date

12. **Number of flowering spadices in male tree**
    To be recorded as average of 5 random male trees
    Quantitative

13. **Number of flowering spadices in female tree**
    To be recorded as average of 5 random female trees
    Quantitative

14. **Branching habit of female spadix**
    To be recorded at peak flowering stage
    3 Compact
    5 Moderately broad
    7 Broad

15. **Flowering spadix size**
    To be recorded at peak flowering stage
    3 Small
    5 Medium
    7 Large

16. **Number of flower buds in female trees**
    To be recorded as average of same 5 female trees
    Quantitative

17. **Date of start of male flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date
18. **Date of end of male flowering (dd/mm/yyyy)**
   To be recorded when 85-90% flower buds have opened
   Date

19. **Date of start of female flowering (dd/mm/yyyy)**
   To be recorded when 5% flower buds have opened
   Date

20. **Date of end of female flowering (dd/mm/yyyy)**
   To be recorded when 85-90% flower buds have opened
   Date

21. **Extent of fruit set**
   To be recorded after completion of fruit set
   3. Low
   5. Medium
   7. High

22. **Number of bunches**
   To be recorded as average of 5 random trees at harvest
   Quantitative

23. **Bunch length (cm)**
   To be recorded as average of 10 random bunches at harvest
   Quantitative

24. **Bunch width (cm)**
   To be recorded as average of same 10 bunches at harvest
   Quantitative

25. **Number of strands per bunch**
   To be recorded as average of 5 random bunches at harvest
   Quantitative

26. **Strand length (cm)**
   To be recorded as average of 10 random strands from same 5 bunches at harvest
   Quantitative

27. **Number of berries per strand**
   To be recorded as average of 3 random strands at harvest
   Quantitative
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

28. Berry length (mm)  
To be recorded as average of 10 random berries  
Quantitative

29. Berry width (mm)  
To be recorded as average of same 10 berries  
Quantitative

30. Berry weight (g)  
To be recorded as average of same 10 berries  
Quantitative

31. Berry skin colour at ‘Doka’ stage  
1 Yellow  
2 Red  
99 Others (Specify in the ‘Remarks’ descriptor)

32. Berry skin colour at ‘Pind’ stage  
To be recorded on fully developed ripe berries  
1 Light yellow  
2 Yellow  
3 Yellowish red  
4 Brownish red  
5 Red  
99 Others (Specify in the ‘Remarks’ descriptor)

33. Berry shape  
To be recorded at ‘Pind’ stage  
1 Ovate  
2 Oval  
3 Obovate  
4 Elliptical

34. Berry apex  
To be recorded at ‘Pind’ stage  
1 Round  
2 Tappering

35. Date of fruit ripening (dd/mm/yyyy)  
To be recorded on fully developed ripe berries at ‘pind’ stage  
Date
36. **Uniformity in ripening**
   To be recorded at the time of harvest
   1. Uniform
   2. Irregular

37. **Total soluble solids (%)**
   To be measured with refractometer on ripe berries
   Quantitative

38. **Pulp colour**
   To be recorded on mature berry
   1. Light yellow
   2. Yellow
   3. Pinkish Yellow
   4. Reddish
   5. Brown
   99. Others (Specify in the 'Remarks' descriptor)

39. **Pulp thickness (mm)**
   To be recorded as average of 5 random berries
   Quantitative

40. **Organoleptic test at 'pind' stage**
   3. Poor
   5. Medium
   7. Good
   9. Excellent

41. **Organoleptic test at 'dang' stage**
   3. Poor
   5. Medium
   7. Good
   9. Excellent

42. **Suitability for dehydration**
   To be recorded on ripe berry after harvest
   0. Unsuitable
   3. Poor
   5. Fair
   7. Good
   9. Excellent

43. **Seed length (mm)**
   To be recorded as average of 10 random seeds
   Quantitative
44. **Seed width (mm)**
   To be recorded as average of same 10 seeds
   Quantitative

45. **Seed weight (g)**
   To be recorded as average of same 10 seeds
   Quantitative

46. **Seed colour**
   To be recorded on mature seed
   1 Light yellow
   2 Yellow
   3 Whitish red
   4 Reddish
   5 Brownish

47. **Seed suture**
   To be recorded on mature seed
   3 Shallow
   5 Medium
   7 Deep

48. **Productivity status**
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

49. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

50. **Biotic notes**
   Text

51. **Remarks**
   Text
Fig (Ficus carica L.)
Hindi: Anjeer

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   - 1 Cutting
   - 2 Layered
   - 3 Budded
   - 99 Others (Specify in the 'Remarks' descriptor)

2. Root stock used
   - 1 Brown Turkey cutting
   - 99 Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   To be measured from ground level to the tip of the highest shoot
   Quantitative

4. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

5. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative

6. Tree habit
   - 3 Upright
   - 5 Spreading
   - 7 Drooping

7. Number of trunk shoots
   To be recorded as average of 5 random plants before flowering
   Quantitative

8. Leaf shape
   To be recorded on mature leaf
   - 1 Ovate
   - 2 Orbicular
   - 99 Others (Specify in the 'Remarks' descriptor)
9. Leaf lobe number
To be recorded as average of 10 random mature leaves
Quantitative

10. Leaf texture (dorsal side)
To be recorded on mature leaf

3 Slightly rough
5 Rough
7 Very rough

11. Leaf texture (ventral side)
To be recorded on mature leaf

3 Slightly pubescent
5 Pubescent
7 Highly pubescent

12. Leaf retention

3 Deciduous
5 Semi-deciduous
7 Evergreen

13. Pollination status

1 Self-pollinated
2 Cross-pollinated
3 Parthenocarpic
4 Parthenocarpic in first year and later on cross pollinated
99 Others (Specify in the 'Remarks' descriptor)

14. Sex behaviour

1 Pistillate, the fruit develops as parthenocarpic
2 Pistillate as well as staminate flowers
3 Pistillate and requires cross pollination from caprifigs

15. Fruit maturity time

3 Early
5 Mid
7 Late

16. Fruit shape
To be recorded on mature fruit

1 Round
2 Pyriform
3 Bell shaped
99 Others (Specify in the 'Remarks' descriptor)
17. Fruit length (mm)  
   To be recorded as average of 10 random mature fruits  
   Quantitative

18. Fruit width (mm)  
   To be recorded as average of same 10 fruits  
   Quantitative

19. Fruit weight (g)  
   To be recorded as average of same 10 fruits  
   Quantitative

20. Fruit skin colour  
   To be recorded on mature fruit  
   1 White  
   2 Creamy amber  
   3 Yellow  
   4 Pale green  
   5 Green  
   6 Brown  
   7 Brownish black  
   8 Light purple  
   99 Others (Specify in the 'Remarks' descriptor)

21. Pulp colour  
   To be recorded on mature fruit  
   1 Whitish  
   2 Yellowish  
   3 Pinkish  
   99 Others (Specify in the 'Remarks' descriptor)

22. Pulp aroma  
   To be recorded on mature fruit  
   3 Mild  
   5 Moderate  
   7 Strong

23. Pulp texture  
   To be recorded on mature fruit  
   1 Melting  
   3 Soft  
   5 Medium  
   7 Firm
24. Total soluble solids (%)  
   To be measured with refractometer  
   Quantitative

25. Seediness  
   To be recorded on mature fruit
   0 Absent  
   1 Present

26. Seed size  
   To be recorded on mature fruit
   3 Very small  
   5 Small  
   7 Medium  
   9 Large

27. Fruit drying quality  
   1 Unfit  
   2 Partially fit  
   3 Most suitable

28. Productivity status  
   To be recorded at the time of harvest
   3 Low  
   5 Medium  
   7 High

29. Biotic Stress Susceptibility  
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility  
   3 Low  
   5 Intermediate  
   7 High  
   9 Very high

30. Biotic notes  
   Text

31. Remarks  
   Text
Grape (Vitis vinifera L.)

Hindi: Angoor

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Grafted
   4. Budding
   99. Others (Specify in the 'Remarks' descriptor)

2. **Young shoot tip form**
   To be observed before flowering on a shoot (Shoot tip scope above the 1st unfolded leaf)
   3. Close
   5. Half open
   7. Open

3. **Bark peeling**
   To be recorded at the end of dormancy
   0. Non peeling
   1. Peeling
4. Peeling flakes
To be recorded at the end of dormancy in stem having minimum 12 cm girth
1. Short strips
2. Checks
3. Long strips

5. Under bark colour
To be recorded at the end of dormancy
1. Creamish
2. Light yellow
3. Light brown
99. Others (Specify in the ‘Remarks’ descriptor)

6. Shoot tip anthocyanin intensity
To be recorded during summer months
0. Absent
1. Very weak
3. Weak
5. Medium
7. Strong
9. Very strong

7. Prostrate hairs of shoot tip
To be recorded during summer months
0. None
1. Very sparse
3. Sparse
5. Medium
7. Dense
9. Very dense

8. Tendril distribution on shoot
To be recorded during summer months up to 6th node from growing tip
1. Discontinuous (2 or less)
2. Sub-continuous (3 - 4)
3. Continuous (more than 4)

9. Tendril type
To be recorded during summer months
1. Unifid
2. Bifid
3. Trifid
99. Others (Specify in the ‘Remarks’ descriptor)
10. Young leaf colour
To be recorded on first open leaf during summer months

1. Light green
2. Green
3. Pink
4. Pinkish red
5. Coppery
6. Light purple
99. Others (Specify in the 'Remarks' descriptor)

11. Mature leaf size
To be recorded in between 5th to 8th leaf of mature shoot during summer months

1. Very small
3. Small
5. Medium
7. Large
9. Very large

12. Number of leaf lobes
To be recorded as average of 10 random leaves in between 5th to 8th nodes of mature shoot during summer months

0. Non lobed
3. Three
5. Five
7. More than five

13. Mature leaf tooth shape
To be recorded in between 5th to 8th node of mature shoot during summer months

1. Both sides concave
2. Both sides straight (rectilinear)
3. Both sides convex
4. One side concave and one side convex
5. Mixture of both sides straight and both sides convex

14. Mature leaf petiole sinus shape
To be recorded in between 5th to 8th node of mature shoot during summer months

1. Wide open
2. Open
3. Slightly open
4. Closed
5. Lobes slightly overlapping
6. Lobes overlapping
7. Lobes strongly overlapping
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

1. Wide open
2. Open
3. Slightly Open
4. Closed
5. Lobes slightly overlapping
6. Lobes overlapping
7. Lobes strongly overlapping

Mature leaf petiole sinus shape

15. Leaf hair type
   To be recorded on dorsal side during summer months
   0  Absent
   1  Erect between veins
   2  Prostrate between veins

16. Flower sex
    To be recorded at peak flowering on middle of panicle
    1  Male
    2  Male to hermaphrodite
    3  Hermaphrodite
    4  Female with upright stamens
    5  Female with descending stamens

17. Date of start of flowering (dd/mm/yyyy)
    To be recorded when 5% flower buds have opened
    Date

18. Date of end of flowering (dd/mm/yyyy)
    To be recorded when 85-90% flower buds have opened
    Date
1. Male
2. Male to hermaphrodite
3. Hermaphrodite
4. Female with upright stamens
5. Female with descending stamens

**Flower sex**

19. **Bunch length (cm)**
   To be recorded as average of 10 random bunches
   Quantitative

20. **Bunch width (cm)**
    To be recorded as average of same 10 bunches
    Quantitative

21. **Peduncle length (cm)**
    To be recorded as average of same 10 bunches
    Quantitative
22. **Bunch type**
   To be recorded at the time of harvest
   1. Non winged
   2. Winged
   3. Double bunched

23. **Bunch density**
   To be recorded at the time of harvest
   1. Very loose
   3. Loose
   5. Medium
   7. Dense
   9. Very dense

24. **Bunch weight (g)**
   To be recorded as average of same 10 bunches
   Quantitative

25. **Number of berries**
   To be recorded as average of same 10 bunches
   Quantitative

26. **Berry length (mm)**
   To be recorded as average of 20 random berries from middle 1/3rd bunch at the time of harvest
   Quantitative

27. **Berry width (mm)**
   To be recorded as average of same 20 berries
   Quantitative

28. **Berry weight (g)**
   To be recorded as average of same 20 berries
   Quantitative

29. **Ripe berry skin colour**
   To be recorded at the time of harvest
   1. Green yellow
   2. Rose
   3. Red
   4. Red grey
   5. Dark red violet
   6. Blue black
   7. Red black
   99. Others (Specify in the 'Remarks' descriptor)
30. **Berry shape**  
To be recorded at the time of harvest

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<tr>
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<td>1</td>
<td>Flat</td>
<td>2</td>
<td>Slightly flat</td>
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<td>4</td>
<td>Short elliptic</td>
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<td>7</td>
<td>Obovate</td>
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<td>Cylindric</td>
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<td>10</td>
<td>Arched</td>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
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![Berry shapes diagram]

31. **Berry Pulp colour**  
To be recorded at the time of harvest

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<table>
<thead>
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<td>0</td>
<td>Colourless</td>
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<tr>
<td>1</td>
<td>Coloured (tienturia)</td>
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</tbody>
</table>

32. **Total soluble solids (%)**  
To be measured with refractometer  
Quantitative

33. **Juice content (g)**  
To be measured as volume (ml) per weight (g) basis  
Quantitative
34. **Fruit firmness**
   To be recorded by penetrometer/tenderometer at the time of harvest
   
   1. Very soft
   2. Soft
   3. Medium
   4. Firm
   5. Very firm

35. **Seediness**
   To be recorded at the time of harvest
   
   0. Absent
   1. Rudimentary (soft, under developed seeds)
   2. Present (seed fully developed)

36. **Seed weight (mg)**
   To be recorded as average of 100 dry seeds
   
   Quantitative

37. **Productivity status**
   To be recorded at the time of harvest
   
   3. Low
   5. Medium
   7. High

38. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
   1. Very low or no visible sign of susceptibility
   3. Low
   5. Intermediate
   7. High
   9. Very high

39. **Biotic notes**
   Text

40. **Remarks**
   Text
Guava (*Psidium guajava* L.)

**Hindi : Amrood**

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   
   1. Seedling
   2. Layered
   3. Grafted
   4. Budded
   99 Others (Specify in the 'Remarks' descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot during flowering stage
   
   Quantitative

3. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   
   Quantitative

4. **Foliation density**
   To be recorded just after the rainy season
   
   3. Sparse
   5. Medium dense
   7. Dense
   9. Very dense

5. **Tree habit**
   To be recorded just after the rainy season
   
   3. Upright
   5. Spreading
   7. Drooping

6. **Leaf shape**
   To be recorded on mature leaf
   
   1. Ovate
   2. Oblong-lanceolate
   3. Elliptic
   4. Lanceolate
   99 Others (Specify in the ‘Remarks’ descriptor)
7. **Mature leaf colour**
   To be recorded just after the rainy season
   1. Pale green
   2. Green
   3. Dark green
   4. Purple
   99. Others (Specify in the 'Remarks' descriptor)

8. **Inflorescence type**
   To be recorded at the time of flowering
   1. Solitary flower bud
   2. Cymes of two or three flowers

9. **Date of first fruit maturity (dd/mm/yyyy)**
   To be recorded as date when first fruit attains physiological maturity
   Date

10. **Fruit shape**
    To be recorded at physiological maturity
    1. Sub globose
    2. Globose
    3. Pear shaped
    4. Oblong
    5. Oval
    99. Others (Specify in the 'Remarks' descriptor)

11. **Fruit surface**
    To be recorded at physiological maturity
    1. Smooth
    2. Bumpy
    3. Ridged
    99. Others (Specify in the 'Remarks' descriptor)

12. **Fruit length (cm)**
    To be recorded as average of 10 random mature fruits
    Quantitative

13. **Fruit width (cm)**
    To be recorded as average of same 10 fruits
    Quantitative

14. **Fruit weight (g)**
    To be recorded as average of same 10 fruits
    Quantitative
Guava (*Psidium guajava* L.)

15. **Fruit skin colour**
   To be recorded when the fruit is fully ripe but not over ripe
   1 White
   2 Creamy white
   3 Yellowish white
   4 Greenish white
   5 White with red blush
   6 Yellow with red blush
   7 Yellow with brown russetting
   8 Pinkish red
   99 Others (Specify in the 'Remarks' descriptor)

16. **Pink dots on the skin**
   To be recorded on ripe fruit but not on over ripe fruit
   1 Few
   2 Intermediate
   3 Many

17. **Pulp colour**
   To be recorded on ripe fruit but not on over ripe fruit
   1 White
   2 Creamy white
   3 Greenish white
   4 Yellowish
   5 Pink
   6 Light red
   7 Dark red
   99 Others (Specify in the 'Remarks' descriptor)

18. **Pulp thickness (mm)**
   To be recorded as average of same 10 fruits
   Quantitative

19. **Pulp texture**
   To be recorded on ripe fruit but not on over ripe fruit
   1 Very soft
   3 Soft
   5 Medium hard
   7 Hard
   9 Very hard

20. **Pulp grittiness**
   To be recorded on ripe fruit but not on over ripe fruit
   3 Low
   5 Medium
   7 High
21. Pulp flavour
To be recorded on ripe fruit but not on over ripe fruit
0 Absent
3 Mild
5 Moderate
7 Strong

22. Fruit taste
To be recorded on ripe fruit but not on over ripe fruit
1 Acidic
3 Less sweet
5 Medium sweet
7 Highly sweet

23. Total soluble solids (%)
To be measured with refractometer on ripe fruit but not on over ripe fruit
Quantitative

24. Ascorbic acid content (mg/100 g pulp)
To be recorded on ripe fruit but not on over ripe fruit
Quantitative

25. Seediness
To be recorded on ripe fruit but not on over ripe fruit
0 Seedless
3 Low
5 Medium
7 High

26. Seed hardness
To be recorded on ripe fruit but not on over ripe fruit
3 Soft
5 Intermediate
7 Hard

27. Productivity status
To be recorded at the time of harvest
3 Low
5 Medium
7 High
28. **Biotic Stress Susceptibility**  
Specify the infestation or infection using 1-9 scale.  

Note: For additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.  

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Very low or no visible sign of susceptibility</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

29. **Biotic notes**  
Text

30. **Remarks**  
Text
Jackfruit (*Artocarpus* species)  
Hindi: Kathal, Barhal etc.

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Layered
   3. Grafted
   99. Others (Specify in the ‘Remarks’ descriptor)

2. **Rootstock used**
   1. Seedling
   99. Others (Specify in the ‘Remarks’ descriptor)

3. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

4. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering and at 15 cm above the graft union in grafted/budded ones
   Quantitative

5. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   Quantitative

6. **Tree habit**
   1. Erect
   2. Semi erect
   3. Spreading

7. **Tree shape**
   1. Pyramidal
   2. Broadly pyramidal
   3. Spherical
   4. Oblong
   5. Semi circular
   6. Elliptic
   7. Irregular
   99. Others (Specify in the ‘Remarks’ descriptor)
8. **Leaf shape**

To be recorded on mature leaf

1. Ovate
2. Ovate-oblong
3. Obovate
4. Lanceolate
5. Elliptic
6. Irregular

---

**Tree shape**

1  2  3  4

5  6  7

**Leaf shape**

1  2  3

4  5  6
9. **Leaf apex**
   To be recorded on mature leaf
   1. Acute
   2. Acuminate
   3. Retuse
   4. Obtuse

10. **Leaf base**
    To be recorded on mature leaf
    1. Oblique
    2. Rounded
    3. Cuneate
    4. Shortly attenuate

11. **Leaf margin**
    To be recorded on mature leaf
    1. Smooth
    2. Wavy
    3. Wrinkled
    4. Folded

12. **Leaf texture**
    To be recorded on mature leaf
    1. Soft
    2. Coriaceous
    3. Hard
    4. Brittle
13. **Leaf colour**
To be recorded on dorsal side of mature leaf

1. Light green
2. Green
4. Dark green
5. Pinkish green
99. Others (Specify in the 'Remarks' descriptor)

14. **Female inflorescence position**
To be recorded during flowering

1. On main trunk only
2. On main trunk and primary branches
3. On main trunk, primary and secondary branches
4. On the whole stem including primary, secondary and tertiary branches

15. **Date of start of female flowering** (dd/mm/yyyy)
To be recorded when first female flower appeared

16. **Date of end of female flowering** (dd/mm/yyyy)
To be recorded when last female flower appeared

17. **Date of first fruit harvest** (dd/mm/yyyy)
To be recorded when first fruit attains maturity

18. **Date of last fruit harvest** (dd/mm/yyyy)
To be recorded when last fruit attains maturity

19. **Fruit shape**
To be recorded on mature fruit

1. Obloid
2. Spheroid
3. Ellipsoid
4. Clavate
5. Oblong
6. Irregular
99. Others (Specify in the 'Remarks' descriptor)
20. Shape of junction of stalk attachment to fruit
To be recorded on mature fruit
1 Depressed
2 Flattened
3 Inflated

21. Fruit bearing habit
To be recorded at the time harvest
1 Solitary
2 Cluster

22. Fruiting behaviour
1 Regular
2 Alternate
3 Irregular

23. Fruit maturity group
To be recorded at the time harvest
1 Very early
3 Early
5 Mid
7 Late
9 Very late
24. Days to fruit ripening
   To be recorded as number of days from harvest to edible ripening at room temperature
   Quantitative

25. Fruit length (cm)
   To be recorded as average of 5 random mature fruits
   Quantitative

26. Fruit width (cm)
   To be recorded as average of same 5 fruits
   Quantitative

27. Fruit weight (kg)
   To be recorded as average of same 5 fruits
   Quantitative

28. Fruit rind colour
   To be recorded on mature fruit
   1 Green
   2 Greenish yellow
   3 Yellow
   4 Reddish yellow
   5 Brown
   99 Others (Specify in the ‘Remarks’ descriptor)

29. Number of flakes per fruit
   To be recorded as average of same 5 fruits
   Quantitative

30. Flake length (cm)
   To be recorded as average of 10 random flakes
   Quantitative

31. Flake width (cm)
   To be recorded as average of same 10 flakes
   Quantitative

32. Flake weight with seeds (g)
   To be recorded as average of same 10 flakes
   Quantitative
33. Flake shape
To be recorded on ripe but not on over ripe fruit

1  Spheroid
2  Cordate
3  Twisted
4  Obovate
5  Rectangular
6  Oblong with curved tip
7  Irregular
99  Others (Specify in the 'Remarks' descriptor)

34. Flake colour
To be recorded on ripe but not on over ripe fruit

1  White
2  Creamy white
3  Light yellow
4  Yellow
5  Deep yellow
6  Coppery red
99  Others (Specify in the 'Remarks' descriptor)

35. Flake aroma
To be recorded on ripe but not on over ripe fruit

3  Mild
5  Moderate
7  Strong

36. Total soluble solids (%)
To be measured with refractometer

Quantitative
37. **Spine shape**  
   To be recorded on mature fruit  
   1 Flat (non-pointed)  
   2 Intermediate  
   3 Sharp pointed  

38. **Number of fruits per tree**  
   To be recorded as average of 5 random trees  
   Quantitative  

39. **Number of seeds per fruit**  
   To be recorded as average of same 5 fruits  
   Quantitative  

40. **Seed shape**  
   To be recorded on ripe fruit  
   1 Spheroid  
   2 Ellipsoid  
   3 Elongate  
   4 Oblong  
   5 Reniform  
   6 Irregular  
   99 Others (Specify in the ‘Remarks’ descriptor)  

![Seed shape diagrams]

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**Seed shape**
41. Seed surface sliminess
   To be recorded on ripe fruit
   1  Almost absent
   3  Slightly slimy
   5  Intermediate
   7  Highly slimy

42. Seed length (mm)
   To be recorded as average of 10 random seeds
   Quantitative

43. Seed width (mm)
   To be recorded as average of same 10 seeds
   Quantitative

44. Seed weight (g)
   To be recorded as average of same 10 seeds
   Quantitative

45. Seed vivipary
   To be recorded on ripe fruit
   0  Absent
   3  Less
   5  Intermediate
   7  High

46. Productivity status
   To be recorded at the time of harvest
   3  Low
   5  Medium
   7  High

47. Biotic Stress Susceptibility
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

48. Biotic notes
   Text

49. Remarks
   Text
Jamun (Syzygium cumini (L) Skeels)

Hindi: Jamun

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   4. Grafted
   5. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. Tree spread (m)
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   Quantitative

5. Tree habit
   3. Upright
   5. Spreading
   7. Drooping

6. Bark colour
   1. Light grey
   2. Grey
   3. Brown
   99. Others (Specify in the 'Remarks' descriptor)
7. **Trunk wood colour**
   1. Reddish grey
   2. Brownish grey
   3. Dull brownish
   99. Others (Specify in the 'Remarks' descriptor)

8. **Leaf shape**
   To be recorded on mature leaf
   1. Broadly ovate
   2. Elliptic oblong
   3. Elliptic
   4. Lanceolate
   99. Others (Specify in the 'Remarks' descriptor)

9. **Leaf glands**
   To be recorded on mature leaf
   0. Absent
   1. Present

10. **Leaf surface**
    To be recorded on mature leaf
    1. Coriaceous
    2. Mild coriaceous

11. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

12. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date

13. **Flower colour**
    To be recorded just after flowering
    1. Light yellow
    2. Greenish white
    99. Others (Specify in the 'Remarks' descriptor)

14. **Extent of fruit drop**
    3. Low
    5. Medium
    7. High
15. Fruit shape
   To be recorded on mature fruit
   1 Round
   2 Oblong
   3 Oval
   4 Ellipsoid
   99 Others (Specify in the 'Remarks' descriptor)

16. Fruit colour
   To be recorded on mature fruit
   1 Pinkish
   2 Deep purple
   3 Violet
   4 Bluish black
   99 Others (Specify in the 'Remarks' descriptor)

17. Fruit length (mm)
   To be recorded as average of 10 random mature fruits
   Quantitative

18. Fruit width (mm)
   To be recorded as average of same 10 fruits
   Quantitative

19. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative

20. Fruit skin waxiness
   To be recorded on mature fruit
   3 Less
   5 Medium
   7 High

21. Fruit base
   To be recorded on mature fruit
   1 Depressed
   2 Flat
   3 Projected

22. Pulp colour
   To be recorded on mature fruit
   1 Whitish
   2 Pinkish
   3 Purple pink
   99 Others (Specify in the 'Remarks' descriptor)
23. Juiciness
   To be recorded on mature fruit
   3  Less
   5  Medium
   7  High

24. Fruit maturity
   3  Early
   5  Mid
   7  Late

25. Total soluble solids (%)
   To be measured with refractometer
   Quantitative

26. Fruit taste
   To be recorded on mature fruit
   1  Sub-acidic
   2  Less sweet
   3  Sweet

27. Fruit astringency
   To be recorded on mature fruit
   3  Mild
   5  Moderate
   7  Strong

28. Presence of seed
   To be recorded on mature fruit
   1  Rudimentary (inconspicuous)
   2  Present (conspicuous)

29. Stone length (mm)
   To be recorded as average of same 10 fruits
   Quantitative

30. Stone width (mm)
   To be recorded as average of same 10 fruits
   Quantitative

31. Stone weight (g)
   To be recorded as average of same 10 fruits
   Quantitative
32. Pulp - seed ratio
   To be calculated on the basis of fruit and stone weight
   Quantitative

33. Number of seeds per fruit
   To be recorded on mature fruit
   1   Single
   2   2-3 seeds, compressed together resembling a single seed
   3   4-5 seeds, compressed together resembling a single seed

34. Productivity status
   To be recorded at the time of harvest
   3   Low
   5   Medium
   7   High

35. Biotic Stress Susceptibility
   Specify the infestation or infection using 1 - 9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and
causal organism(s) may be appended in the Biotic notes descriptor.
   1   Very low or no visible sign of susceptibility
   3   Low
   5   Intermediate
   7   High
   9   Very high

36. Biotic notes
   Text

37. Remarks
   Text
Karonda (*Carissa* species)
Hindi: Karonda

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   99. Others (Specify in the 'Remarks' descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of highest shoot
   Quantitative

3. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative

5. Tree habit
   3. Upright
   5. Spreading
   7. Drooping
   9. Climbing

6. Leaf shape
   To be recorded on mature leaf
   1. Oblong
   2. Oval
   99. Others (Specify in the 'Remarks' descriptor)
7. **Leaf colour**
   To be recorded on mature leaf
   1. Light green
   2. Green
   3. Greenish yellow
   99. Others (Specify in the ‘Remarks’ descriptor)

8. **Thorn length**
   To be recorded on mature thorn
   3. Small
   5. Medium
   7. Large

9. **Thorn shape**
   To be recorded on mature thorn
   1. Simple
   2. Forked
   3. Curved

10. **Young shoot colour**
    1. Green beneath and pinkish above
    2. Green beneath and pale yellow above
    3. Green on both sides

11. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

12. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date

13. **Flower type**
    To be recorded during flowering
    1. Single
    2. Cluster
    3. Both

14. **Petal colour**
    To be recorded just after flowering
    1. White
    2. White with pink
    3. Dull white
15. **Flower fragrance**
   To be recorded during flowering
   3  Mild
   5  Moderate
   7  Strong

16. **Fruit shape**
   To be recorded on mature fruit
   1  Globose
   2  Ellipsoid
   3  Oval
   99  Others (Specify in the 'Remarks' descriptor)

17. **Fruit length (mm)**
   To be recorded as average of 10 random mature fruits
   Quantitative

18. **Fruit width (mm)**
   To be recorded as average of same 10 fruits
   Quantitative

19. **Fruit weight (g)**
   To be recorded as average of same 10 fruits
   Quantitative

20. **Unripe fruit skin colour**
   1  White
   2  Green
   3  White with pink blush
   4  Pink
   99  Others (Specify in the 'Remarks' descriptor)

21. **Ripe fruit skin colour**
   1  White
   2  Green
   3  Pinkish white
   4  Pink
   5  Violet
   99  Others (Specify in the 'Remarks' descriptor)

22. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative
23. **Pulp colour**
   To be recorded on mature fruit
   1. White
   2. Pink
   3. Violet
   99. Others (Specify in the 'Remarks' descriptor)

24. **Juiciness**
   To be recorded on ripe fruit
   3. Low
   5. Medium
   7. High

25. **Acidity (%)**
   Quantitative

26. **Fruit latex**
   To be recorded on ripe fruit
   0. Absent
   1. Present

27. **Fruit firmness**
   To be recorded on mature fruit
   3. Soft
   5. Medium
   7. Hard

28. **Fruit skin texture**
   To be recorded on mature fruit
   3. Smooth
   5. Intermediate
   7. Rough

29. **Number of seeds per fruit**
   To be recorded as average of same 10 fruits
   Quantitative

30. **Seed size**
   To be recorded on ripe fruit
   3. Small
   5. Medium
   7. Large
31. **Seed colour**
   To be recorded on ripe fruit
   1 White
   2 Dull white
   3 Brown
   4 Black
   99 Others (Specify in the 'Remarks' descriptor)

32. **Seed shape**
   To be recorded on ripe fruit
   1 Oval
   2 Lanceolate
   99 Others (Specify in the 'Remarks' descriptor)

33. **Seed weight (g)**
   To be recorded as average of 20 random seeds
   Quantitative

34. **Productivity status**
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

35. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1-9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

36. **Biotic notes**
   Text

37. **Remarks**
   Text
Lasora (Cordia myxa Roxb.)

Hindi: Lasara

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1 Seedling
   2 Budded
   3 Grafted
   99 Others (Specify in the ‘Remarks’ descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period
   Quantitative

5. Tree habit
   3 Upright
   5 Semi-spreading
   7 Spreading
   9 Drooping

6. Trunk smoothness
   3 Smooth
   5 Medium crooked
   7 Highly crooked

7. Wood colour
   1 Clear yellow, changes to greyish brown on exposure
   2 Light brown changes to bluish grey and later on to dark brown
   3 Light brown, changes to dark brown with age
   99 Others (Specify in the ‘Remarks’ descriptor)
8. **Tree nature**
   1. Evergreen
   2. Partially deciduous
   3. Deciduous

9. **Leaf length (cm)**
   To be recorded as average of 10 random leaves
   Quantitative

10. **Leaf width (cm)**
    To be recorded as average of same 10 leaves
    Quantitative

11. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

12. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date

13. **Inflorescence size**
    To be recorded during flowering
    1. Small
    2. Large

14. **Number of inflorescences per branch**
    To be recorded as average of 5 random branches at flowering stage
    Quantitative

15. **Flower fragrance**
    To be recorded during flowering
    0. Absent
    1. Present

16. **Petal colour**
    To be recorded during flowering
    1. White
    2. Dull white
    99. Others (Specify in the ‘Remarks’ descriptor)

17. **Date of 50% fruit ripening (dd/mm/yyyy)**
    To be recorded as date when 50% fruits ripen
    Date
18. **Fruit length (mm)**
   To be recorded as average of 10 random ripe fruits
   Quantitative

19. **Fruit width (mm)**
   To be recorded as average of same 10 fruits
   Quantitative

20. **Fruit weight (g)**
   To be recorded as average of same 10 fruits
   Quantitative

21. **Fruit shape**
   To be recorded on ripe fruits at the time of harvest
   1 Ovoid
   2 Oblong
   3 Oval
   99 Others (Specify in the 'Remarks' descriptor)

22. **Fruit colour**
   To be recorded on fully ripe fruit
   1 Pink
   2 Yellowish brown
   3 Black
   99 Others (Specify in the 'Remarks' descriptor)

23. **Fruit skin thickness**
   To be recorded on ripe fruit
   3 Thin
   5 Medium thick
   7 Thick

24. **Pulp transparency**
   To be recorded on ripe fruit
   3 Low
   5 Medium
   7 High

25. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

26. **Mucilage content**
   To be recorded on ripe fruit
   3 Less
   5 Medium
   7 High
27. Pulp thickness (mm)  
To be recorded as average of 10 random ripe fruits  
Quantitative

28. Stone length (mm)  
To be recorded as average of stones of same 10 fruits  
Quantitative

29. Stone width (mm)  
To be recorded as average of same 10 stones  
Quantitative

30. Stone thickness (mm)  
To be recorded as average of same 10 stones  
Quantitative

31. Stone weight (g)  
To be recorded as average of same 10 stones  
Quantitative

32. Pulp-stone ratio  
To be calculated on the basis of fruit weight and stone weight  
Quantitative

33. Productivity status  
To be recorded at the time of harvest
3  Low  
5  Medium  
7  High

34. Biotic Stress Susceptibility  
Specify the infestation or infection using 1-9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility  
3  Low  
5  Intermediate  
7  High  
9  Very high

35. Biotic notes  
Text

36. Remarks  
Text
Litchi (*Litchi chinensis* (Gaerth.) Sonn.)

Hindi: Leechee

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Cutting
   - 3 Layered
   - 4 Stooled
   - 99 Others (Specify in the ‘Remarks’ descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative

5. **Tree habit**
   To be recorded during flowering
   - 3 Upright
   - 5 Spreading
   - 7 Drooping

6. **Young shoot colour**
   - 1 Light green
   - 2 Yellowish green
   - 3 Light purple
   - 99 Others (Specify in the ‘Remarks’ descriptor)

7. **Number of leaflets per leaf**
   To be recorded as average of 5 random mature leaves
   Quantitative
8. Foliage density
   To be recorded just before flowering
   3 Sparse
   5 Medium
   7 Dense

9. Leaflet colour
   To be recorded on the dorsal side of mature leaflet
   1 Light grey
   2 Intermediate
   3 Shining grey

10. Inflorescence shape
    To be recorded during flowering
    1 Conical
    2 Pyramidal
    3 Broadly pyramidal

11. Inflorescence position
    To be recorded during flowering
    1 Terminal
    2 Axillary
    3 Both

12. Inflorescence compactness
    To be recorded during flowering
    3 Loose
    5 Medium
    7 Compact
13. **Date of start of flowering**
   To be recorded when 5% flower buds have opened
   
   **Date**

14. **Date of end of flowering**
   To be recorded when 85-90% flower buds have opened
   
   **Date**

15. **Sex ratio**
   To be recorded as ratio of hermaphrodite to total number of flowers in 5 random inflorescences
   
   **Quantitative**

16. **Petal colour**
   To be recorded on just opened flower

   1 Greenish white
   2 Greyish
   99 Others (Specify in the 'Remarks' descriptor)

17. **Fruiting habit**

   1 Regular
   2 Mild biennial
   3 Biennial

18. **Number of fruits per panicle**
   To be recorded as average of 10 random panicles
   
   **Quantitative**

19. **Extent of fruit drop**

   3 Low
   5 Medium
   7 High

20. **Fruit shape**
   To be recorded on mature fruit

   1 Round
   2 Oval
   3 Oblong
   4 Cordate
   5 Conical

21. **Fruit length (mm)**
   To be recorded as average of 10 random fruits
   
   **Quantitative**
22. Fruit width (mm)  
To be recorded as average of same 10 fruits  
Quantitative

23. Fruit weight (g)  
To be recorded as average of same 10 fruits  
Quantitative

24. Fruit colour  
To be recorded on mature fruit

1. Greenish yellow  
2. Greenish red  
3. Pinkish red  
4. Red  
5. Dark red  
6. Dull red  
7. Dull purplish  
99. Others (Specify in the 'Remarks' descriptor)

25. Tubercles shape  
To be recorded on mature fruit

3. Flattened  
5. Medium flattened  
7. Pointed

26. Fruit skin thickness (mm)  
To be recorded as average of same 10 mature fruits  
Quantitative

27. Aril colour  
To be recorded on mature fruit

1. White  
2. Creamy white  
3. Yellowish

28. Aril thickness (mm)  
To be recorded as average of same 10 fruits  
Quantitative

29. Aril flavour  
To be recorded on mature fruit

3. Mild  
5. Moderate  
7. Strong
30. **Aril juiciness**
   To be recorded on mature fruit
   3  Less
   5  Medium
   7  High

31. **Total soluble solids (%)**
   To be measured with refractometer

32. **Seed shape**
   To be recorded on mature fruit
   1  Oval
   2  Oblong
   99 Others (Specify in the ‘Remarks’ descriptor)

33. **Seed weight (g)**
   To be recorded as average of seeds of same 10 fruits

34. **Seed colour**
   To be recorded on mature fruit
   1  Light brown
   2  Brown
   3  Dark brown
   99 Others (Specify in the ‘Remarks’ descriptor)

35. **Abnormal seed (%)**
   To be recorded on the basis of 50 random seeds

36. **Fruit cracking**
   To be recorded on mature fruit
   3  Low
   5  Medium
   7  High

37. **Productivity status**
   To be recorded at the time of harvest
   3  Low
   5  Medium
   7  High
38. Biotic Stress Susceptibility

Specify the infestation or infection using 1-9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility
3  Low
5  Intermediate
7  High
9  Very high

39. Biotic notes

Text

40. Remarks

Text
Loquat (*Eriobotrya japonica* Lindl.)

Hindi: Lokat

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible

   1. Seedling
   2. Layered
   3. Grafted
   4. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Rootstock used

   1. Loquat seedling
   2. Quince seedling
   99. Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   To be measured from ground level to the tip of the highest shoot

   Quantitative

4. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones

   Quantitative

5. Tree spread (m)
   To be measured as canopy diameter (average of East - West and North - South dimensions)

   Quantitative

6. Tree habit

   3. Upright
   5. Semi - spreading
   7. Spreading
7. **Tree crown shape**
   To be recorded before flowering
   1. Oval
   2. Oval and open
   3. Uneven and compact
   4. Broad
   5. Rounded
   6. Semi-globose
   7. Semi-globose compact

8. **Foliage density**
   To be recorded before flowering
   3. Low
   5. Medium
   7. High

9. **Leaf shape**
   To be recorded on mature leaf
   1. Lanceolate
   2. Oblanceolate
   3. Elliptic lanceolate
   99. Others (Specify in the 'Remarks' descriptor)

10. **Leaf margin**
    To be recorded on mature leaf
    1. Slightly serrated
    2. Serrated
    3. Remotely toothed
    99. Others (Specify in the 'Remarks' descriptor)

11. **Leaf size**
    To be recorded on mature leaf
    3. Small
    5. Medium
    7. Large

12. **Leaf texture**
    To be recorded on mature leaf
    1. Fine
    2. Coarse

13. **Main flowering season**
    1. August and September
    2. October and November
    3. December and January
14. Inflorescence length (cm)
   To be recorded as average of 5 random inflorescences
   Quantitative

15. Inflorescence width (cm)
   To be recorded as average of same 5 inflorescences
   Quantitative

16. Number of flower buds per inflorescence
   To be recorded as average of same 5 inflorescences
   Quantitative

17. Self compatibility
   1. Incompatible
   2. Partially self incompatible
   3. Partially cross incompatible
   4. Compatible

18. Date of start of flowering (dd/mm/yyyy)
   To be recorded when 5% flower buds have opened
   Date

19. Date of end of flowering (dd/mm/yyyy)
   To be recorded when 85-90% flower buds have opened
   Date

20. Date of fruit harvest (dd/mm/yyyy)
   Date

21. Fruit length (cm)
   To be recorded as average of 10 random fruits
   Quantitative

22. Fruit width (cm)
   To be recorded as average of same 10 fruits
   Quantitative

23. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative
24. Fruit shape  
To be recorded on mature fruit

1. Ovate  
2. Pyriform  
3. Oblong  
4. Oblong pyriform  
5. Ovate globose  
6. Oval

25. Fruit stalk thickness  
To be recorded on mature fruit

3. Thin  
5. Medium  
7. Thick

26. Fruit skin colour  
To be recorded on ripe fruit

1. Creamy white  
2. Pale yellow  
3. Yellow  
4. Golden yellow  
5. Deep yellow  
6. Orange yellow  
7. Saffron yellow  
8. Orange  
99. Others (Specify in the 'Remarks' descriptor)

27. Pulp thickness (mm)  
To be recorded as average of same 10 fruits
  Quantitative

28. Pulp colour  
To be recorded on ripe fruit

1. Creamy white  
2. Yellow  
3. Orange  
4. Pale orange  
5. Light saffron  
99. Others (Specify in the 'Remarks' descriptor)

29. Pulp texture  
To be recorded on ripe fruit

1. Soft  
2. Firm  
3. Crisp  
4. Granular  
5. Melting
30. **Pulp taste**  
To be recorded on ripe fruit  
3 Poor  
5 Medium  
7 Good  
9 Excellent  

31. **Total soluble solids (%)**  
To be measured with refractometer  
Quantitative  

32. **Number of seeds per fruit**  
To be recorded as average of same 10 fruits  
Quantitative  

33. **Seed length (mm)**  
To be recorded as average of seeds of same 10 fruits  
Quantitative  

34. **Seed width (mm)**  
To be recorded as average of same seeds  
Quantitative  

35. **Seed weight (g)**  
To be recorded as average of same seeds  
Quantitative  

36. **Seed colour**  
To be recorded on ripe fruit  
1 White  
2 Whitish brown  
3 Dark brown  
4 Chocolate  
99 Others (Specify in the ‘Remarks’ descriptor)  

37. **Productivity status**  
To be recorded at the time of harvest  
3 Low  
5 Medium  
7 High
38. Biotic Stress Susceptibility

Specify the infestation or infection using 1 - 9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility
3  Low
5  Intermediate
7  High
9  Very high

39. Biotic notes

Text

40. Remarks

Text
Mango (*Mangifera indica* L.)

Hindi: Aam

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   
   - 1 Seedling
   - 2 Grafted
   - 99 Others (Specify in the ‘Remarks’ descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   
   Quantitative

3. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   
   Quantitative

4. **Foliage density**
   To be recorded during the month of November
   
   - 3 Sparse
   - 5 Medium
   - 7 Dense

5. **Inflorescence shape**
   To be recorded at peak flowering stage
   
   - 1 Conical
   - 2 Pyramidal
   - 3 Broadly pyramidal
   - 99 Others (Specify in the ‘Remarks’ descriptor)

6. **Rachis colour (dorsal side)**
   To be recorded at peak flowering stage
   
   - 1 Yellow
   - 2 Yellowish green
   - 3 Pinkish red
   - 4 Red
   - 99 Others (Specify in the ‘Remarks’ descriptor)
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

7. **Date of start of flowering (dd/mm/yyyy)**
   To be recorded when 5% flower buds have opened
   
   Date

8. **Date of end of flowering (dd/mm/yyyy)**
   To be recorded when 85-90% flower buds have opened
   
   Date

9. **Number of hermaphrodite flowers per panicle**
   To be recorded as average of 4 random panicles, 1 each from four directions
   
   Quantitative

10. **Number of male flowers per panicle**
    To be recorded as average of same 4 panicles
    
    Quantitative

11. **Fruit maturity group**
    To be recorded at physiological maturity

    3 Early
    5 Medium
    7 Late

12. **Fruit shape**
    To be recorded at physiological maturity

    1 Oblong
    2 Elliptic / ellipsoid
    3 Round
    99 Others (Specify in the ‘Remarks’ descriptor)
Fruit shape

13. Fruit beak
To be recorded at physiological maturity

<table>
<thead>
<tr>
<th></th>
<th>Non prominent</th>
<th>Just a point</th>
<th>Prominent</th>
<th>Mammiform</th>
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</tbody>
</table>

Fruit beak

14. Fruit apex
To be recorded at physiological maturity

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</tr>
</tbody>
</table>

Fruit base

15. Fruit base
To be recorded at physiological maturity

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<tr>
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<th>Necked</th>
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<th>Round to obliquely round</th>
<th>Obliquely rounded</th>
<th>Slightly flattened and extended</th>
<th>Slightly to obliquely flattened</th>
<th>Flattened</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>
16. Stalk insertion
To be recorded at physiological maturity

1. Squarely
2. Slightly oblique
3. Obliquely
4. Cavity absent
99. Others (Specify in the ‘Remarks’ descriptor)

17. Fruit shoulder
To be recorded at physiological maturity

1. Equal
2. Equal and level
3. Ventral broader and higher than dorsal
4. Unequal
5. Dorsal shoulder sloping to ending in a long curve

18. Fruit skin ground colour
To be recorded on ripe fruit

1. Cream
2. Pale yellow
3. Yellow
4. Apricot yellow
5. Pink
6. Red
7. Purple
8. Orange yellow
99. Others (Specify in the ‘Remarks’ descriptor)

19. Fruit skin blush colour
To be recorded on ripe fruit

0. Absent
1. Pink
2. Crimson
3. Purplish red
99. Others (Specify in the ‘Remarks’ descriptor)

20. Fruit length (cm)
To be recorded as average of 20 random ripe fruits
Quantitative

21. Fruit width (cm)
To be recorded as average of same 20 fruits
Quantitative
22. **Fruit weight (g)**
To be recorded as average of same 20 fruits
Quantitative

23. **Pulp colour**
To be recorded on ripe fruit
1. Cream
2. Yellow
3. Deep yellow
4. Orange
5. Orange yellow
99. Others (Specify in the ‘Remarks’ descriptor)

24. **Fruit skin thickness**
To be recorded on ripe fruit
3. Thin
5. Medium
7. Thick

25. **Pulp texture**
To be recorded on fully ripe fruit but not on over ripe fruit
3. Melting
5. Soft
7. Firm

26. **Unripe fruit taste**
To be recorded at physiological maturity
1. Acidic
2. Strongly acidic
3. Sweetish

27. **Ripe fruit taste**
To be recorded on fully ripe fruit but not on over ripe fruit
3. Acidic
5. Medium sweet
7. Sweet
9. Extremely sweet

28. **Pulp aroma**
To be recorded on fully ripe fruit but not on over ripe fruit
3. Mild
5. Moderate
7. Strong
29. Pulp fibrousness
   To be recorded on fully ripe fruit but not on over ripe fruit
   0  No fibre
   3  Less fibrous
   5  Medium fibrous
   7  Highly fibrous

30. Total soluble solids (%)
   To be measured with refractometer on ripe fruit but not on over ripe fruit
   Quantitative

31. Stone length (cm)
   To be recorded as average of stones of same 20 fruits
   Quantitative

32. Stone width (cm)
   To be recorded as average of same 20 stones
   Quantitative

33. Stone weight (g)
   To be recorded as average of same 20 stones
   Quantitative

34. Utility type
   To be recorded on fully ripe fruit but not on over ripe fruit
   1  Sucking type
   2  Table type

35. Eating quality
   To be recorded on fully ripe fruit but not on over ripe fruit
   3  Poor
   5  Fair
   7  Good
   9  Excellent

36. Productivity status
   To be recorded at the time of harvest
   3  Low
   5  Medium
   7  High
37. Biotic Stress Susceptibility

Specify the infestation or infection using 1-9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility
3  Low
5  Intermediate
7  High
9  Very high

38. Biotic notes

Text

39. Remarks

Text
Mangosteen (*Garcinia mangostana* L.)
Hindi : Mangosteen

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Grafted
   - 99 Others (Specify in the ‘Remarks’ descriptor)

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seeds/layers/cuttings and at 15 cm above the graft union in grafted/budded ones
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   Quantitative

5. **Tree habit**
   - 3 Upright
   - 5 Spreading
   - 7 Drooping

6. **Tree shape**
   - 1 Oval
   - 2 Round
   - 3 Pyramidal

7. **Leaf size**
   To be recorded on mature leaf
   - 3 Small
   - 5 Intermediate
   - 7 Large
8. **Leaf shape**

   To be recorded on mature leaf

   1. Ovate
   2. Oblong lanceolate
   3. Broadly lanceolate
   4. Elliptic obovate

9. **Leaf surface**

   To be recorded on mature leaf

   1. Leathery
   2. Coriaceous

10. **Female inflorescence type**

    To be recorded during flowering

    1. Solitary axillary
    2. Clustered axillary
    9. Others (Specify in the ‘Remarks’ descriptor)

11. **Date of start of female flowering (dd/mm/yyyy)**

    To be recorded when 5% flower buds have opened

    Date

12. **Date of end of female flowering (dd/mm/yyyy)**

    To be recorded when 85-90% flower buds have opened

    Date

13. **Petal colour**

    To be recorded on just opened flower

    1. Yellowish green
    2. Yellowish green with pink borders
    3. Pink
    9. Others (Specify in the ‘Remarks’ descriptor)

14. **Number of stigma lobes**

    To be recorded as average of 10 stigmas

    Quantitative

15. **Date of fruit harvest (dd/mm/yyyy)**

    Date

16. **Fruit shape**

    To be recorded on mature fruit

    1. Globose
    2. Sub-globose
    3. Ovoid
    4. Spherical
    9. Others (Specify in the ‘Remarks’ descriptor)
17. **Fruit skin colour**
   To be recorded on mature fruit
   1. Yellowish
   2. Reddish
   3. Purplish
   4. Dark purplish

18. **Number of fruit carpels**
   To be recorded as average of 10 random mature fruits
   Quantitative

19. **Carpel colour**
   To be recorded on mature fruits
   1. Snow white
   2. Creamy
   99. Others (Specify in the 'Remarks' descriptor)

20. **Fruit length (cm)**
    To be recorded as average of same 10 fruits
    Quantitative

21. **Fruit width (cm)**
    To be recorded as average of same 10 fruits
    Quantitative

22. **Fruit weight (g)**
    To be recorded as average of same 10 fruits
    Quantitative

23. **Total soluble solids (%)**
    To be recorded with refractometer
    Quantitative

24. **Juiciness**
    To be recorded on ripe fruit
    3. Less
    5. Moderate
    7. High

25. **Number of seeds per fruit**
    To be recorded as average of seeds of same 10 fruits
    Quantitative
26. Seed size
   To be recorded on ripe fruit
   3  Small
   5  Medium
   7  Large

27. Seed weight (g)
   To be recorded as average of seeds of same 10 fruits
   Quantitative

28. Productivity status
   To be recorded at the time of harvest
   3  Low
   5  Medium
   7  High

29. Biotic Stress Susceptibility
   Specify the infestation or infection using 1 - 9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

30. Biotic notes
   Text

31. Remarks
   Text
Mulberry (*Morus* species)
Hindi : Shahtoot

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Vegetative

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   - Quantitative

3. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones
   - Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   - Quantitative

5. **Tree habit**
   - 3 Upright
   - 5 Spreading
   - 7 Drooping

6. **Bark colour**
   - 1 Green
   - 2 Reddish
   - 3 Brown
   - 4 Grey
   - 99 Others (Specify in the 'Remarks' descriptor)

7. **Young shoot lenticel intensity**
   - 3 Low
   - 5 Medium
   - 7 High
8. Leaf shape
   To be recorded on mature leaf
   1 Ovate
   2 Broadly ovate
   3 Ovate cordate

9. Leaf lobes
   To be recorded on mature leaf
   1 Unlobed
   2 Lobed
   3 Heterophyllus

10. Leaf surface
    To be recorded on mature leaf
    1 Smooth
    2 Rough
    3 Glossy

11. Leaf pubescence
    To be recorded on mature leaf
    0 Absent
    1 Present

12. Leaf apex
    To be recorded on mature leaf
    1 Acute
    2 Acuminate
    3 Caudate

13. Leaf base
    To be recorded on mature leaf
    1 Truncate
    2 Cordate
    3 Broadly cordate

14. Leaf margin
    To be recorded on mature leaf
    1 Crenate
    2 Serrate
    3 Serrulate
    4 Dentate
15. Flower type
   To be recorded during flowering
   1  Dioecious
   2  Monoecious
   3  Occasionally dioecious
   4  Hermaphroditic

16. Male flower panicle shape
   1  Broadly cylindrical
   2  Ovoid

17. Female flower panicle shape
   1  Pedunculate
   2  Ovoid

18. Date of start of flowering (dd/mm/yyyy)
   To be recorded when 5% flower buds have opened
   Date

19. Date of end of flowering (dd/mm/yyyy)
   To be recorded when 85-90% flower buds have opened
   Date

20. Fruit length (cm)
   To be recorded as average of 10 random fruits
   Quantitative

21. Fruit width (mm)
   To be recorded as average of same 10 fruits
   Quantitative

22. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative

23. Fruit shape
   To be recorded on mature fruit
   1  Ovoid
   2  Oblong
   3  Oval
   4  Sub-globose
   5  Globular
   99  Others (Specify in the ‘Remarks’ descriptor)
24. Fruit colour
To be recorded on ripe fruit
1. White
2. Green
3. Pink
4. Purple
5. Black

25. Fruit stalk length (cm)
To be recorded as average of same 10 fruits
Quantitative

26. Pulp quality
To be recorded on ripe fruit
1. Insipid
3. Acidic
5. Mild sweet
7. Sweet

27. Pulp aroma
To be recorded on ripe fruit
0. Absent
3. Mild
5. Moderate
7. Strong

28. Total soluble solids (%)
To be measured with refractometer
Quantitative

29. Seed colour
To be recorded on ripe fruit
1. Yellowish
2. Light brown
3. Dark brown

30. Productivity status
To be recorded at the time of harvest
3. Low
5. Medium
7. High
31. Biotic Stress Susceptibility

Specify the infestation or infection using 1 - 9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1 Very low or no visible sign of susceptibility
3 Low
5 Intermediate
7 High
9 Very high

32. Biotic notes

Text

33. Remarks

Text
Papaya (*Carica papaya* L.)

Hindi: Papeeta

Descriptors to be recorded on unpruned, untrained plants in the 1st year of bearing with optimal management practices.

1. **Type of planting material**
   - 1 Seedling
   - 99 Others (Specify in the 'Remarks' descriptor)

2. **Plant height (cm)**
   - To be recorded from ground level to apical meristem just before first fruit harvest
   - Quantitative

3. **Trunk girth (cm)**
   - To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period

4. **Stem pigmentation**
   - To be recorded just before first fruit harvest
   - 1 Only or mostly basal
   - 2 Only or mostly lower
   - 3 Only or mostly central
   - 4 Only or mostly upper
   - 5 Indiscriminate

5. **Leaf teeth shape**
   - To be recorded on mature leaf
   - 1 Straight
   - 2 Convex
   - 3 Concave
   - 99 Others (Specify in the 'Remarks' descriptor)

6. **Leaf petiole colour**
   - To be recorded on mature leaf
   - 1 Pale green
   - 2 Normal green
   - 3 Dark green
   - 4 Green and shades of red purple
   - 5 Red purple
   - 99 Others (Specify in the 'Remarks' descriptor)

7. **Leaf petiole length (cm)**
   - To be recorded as average of 5 random mature middle leaves
   - Quantitative
8. **Leaf length (cm)**
   To be recorded as average from base of middle leaflet of same 5 leaves
   Quantitative

9. **Leaf width (cm)**
   To be recorded as average from base of middle leaflet of same 5 leaves
   Quantitative

10. **Flower type**
    To be recorded during flowering
    1 Solitary
    2 Inflorescence
    3 Both

11. **Inflorescence density on trunk**
    To be recorded during flowering
    3 Sparse
    5 Intermediate
    7 Dense

12. **Inflorescence density**
    To be recorded as density of flowers within the inflorescence
    3 Sparse
    5 Intermediate
    7 Dense

13. **Inflorescence stalk colour**
    To be recorded during flowering
    1 Greenish
    2 Purplish/pinkish
    3 Dark red purple/pink
    99 Others (Specify in the ‘Remarks’ descriptor)

14. **Inflorescence main axis length (cm)**
    To be recorded as average of 5 basal inflorescences
    Quantitative

15. **Date of first female flowering (dd/mm/yyyy)**
    To be recorded as date when first female flower appears.
    Date
### Papaya (Carica papaya L.)

16. **Sex form**
- **1** Stamine flowers and few hermaphrodite flowers
- **2** A few stamine flowers and many hermaphrodite flowers
- **3** A few stamine, many hermaphrodite and few pistillate flowers
- **4** Hermaphrodite flowers only
- **5** Mostly hermaphrodite and few pistillate flowers
- **6** Few hermaphrodite and many pistillate flowers
- **7** Only pistillate flowers
- **8** Only stamine flowers

17. **Female flower colour**
To be recorded on completely developed and open flower
- **1** White
- **2** Cream
- **3** Yellow
- **4** Deep yellow to orange
- **5** Greenish
- **6** Dark green
- **7** Yellow/green and red purple shades
- **8** Red purplish (pinkish)
- **9** Dark red purple (pink)
- **99** Others (Specify in the 'Remarks' descriptor)

18. **Hermaphrodite flower colour**
To be recorded on completely developed and open flower
- **1** White
- **2** Cream
- **3** Yellow
- **4** Deep yellow to orange
- **5** Greenish
- **6** Dark green
- **7** Yellow/green and red purple shades
- **8** Red purplish (pinkish)
- **9** Dark red purple (pink)
- **99** Others (Specify in the 'Remarks' descriptor)

19. **Male flower corolla tube colour**
To be recorded on completely developed and open flower
- **1** White
- **2** Cream
- **3** Yellow
- **4** Deep yellow to orange
- **5** Greenish
- **6** Dark green
- **7** Yellow/green and red-purple shades
- **8** Red purplish (pinkish)
- **9** Dark red purple (pink)
- **99** Others (Specify in the 'Remarks' descriptor)
20. **Days to first fruit set**
   To be recorded as number of days from planting to first fruit set
   Quantitative

21. **Number of fruits per plant**
   To be recorded as average of 5 random plants
   Quantitative

22. **Height to first fruit (cm)**
   To be recorded as average of same 5 plants
   Quantitative

23. **Fruit shape**
   To be recorded on fully developed fruit

   1  Globular
   2  Round
   3  High round
   4  Elliptic
   5  Oval
   6  Oblong
   7  Oblong - ellipsoid
   8  Oblong blocky
   9  Elongate
   10 Lengthened cylindrical
   11 Pear shaped (pyriform)
   12 Club
   13 Blossom end tapered
   14 Acron (heart shaped)
   15 Reniform
   16 Turbenate inferior
   17 Plum shaped
   99 Others (Specify in the 'Remarks' descriptor)

24. **Fruit skin colour**
   To be recorded as overall colour of the skin of ripe fruit

   1  Yellow
   2  Deep yellow to orange
   3  Yellowish green
   4  Green
   5  Red purple
   99 Others (Specify in the 'Remarks' descriptor)

25. **Fruit skin thickness**
   To be recorded on ripe fruit

   3  Thin
   5  Medium thick
   7  Thick
26. **Fruit length (cm)**
   
   To be recorded as average of 5 random fruits
   
   Quantitative

27. **Fruit width (cm)**
   
   To be recorded as average of same 5 fruits
   
   Quantitative
28. Fruit weight (g)
   To be recorded as average of same 5 fruits
   Quantitative

29. Stalk end fruit shape
   1. Depressed
   2. Flattened
   3. Inflated
   4. Pointed

30. Pulp colour
   To be recorded on ripe fruit
   1. Light yellow
   2. Bright yellow
   3. Deep yellow to orange
   4. Red
   5. Reddish orange
   6. Scarlet
   99. Others (Specify in the 'Remarks' descriptor)

31. Pulp thickness (mm)
   To be recorded as average of same 5 fruits
   Quantitative

32. Central cavity shape
   To be recorded on fruit transverse section at maximum diameter
   1. Irregular
   2. Round
   3. Angular
   4. Slightly star shaped
   5. Star shaped
   99. Others (Specify in the 'Remarks' descriptor)
166 Papaya (*Carica papaya* L.)

1 Irregular  2 Round  3 Angular  4 Slightly star  5 Star shaped

Central cavity shape

33. **Pulp aroma**
   To be recorded on ripe fruit
   
   3  Mild  
   5  Moderate  
   7  Strong

34. **Total soluble solids (%)**
   To be measured with refractometer
   
   Quantitative

35. **Organoleptic test**
   To be recorded as a combined assessment of flavour, sweetness and aroma of ripe fruit

   3  Poor  
   5  Intermediate  
   7  Good  
   9  Excellent

36. **Number of seeds per fruit**
   To be recorded as average of same 5 fruits
   
   Quantitative

37. **Seed colour**
   To be recorded on ripe fruit

   1  Tan  
   2  Greyish yellow  
   3  Grey  
   4  Brown black  
   5  Black  
   6  Variable  
   99  Others (Specify in the 'Remarks' descriptor)

38. **Productivity status**
   To be recorded at the time of harvest

   3  Low  
   5  Medium  
   7  High
39. Biotic Stress Susceptibility
Specify the infestation or infection using 1 - 9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor

1 Very low or no visible sign of susceptibility
3 Low
5 Intermediate
7 High
9 Very high

40. Biotic notes
Text

41. Remarks
Text
Phalsa (*Grewia subinaequalis* DC.)

Hindi: Phalsa

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seedling</td>
</tr>
<tr>
<td>2</td>
<td>Cutting</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

2. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot
   
   Quantitative

3. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions)
   
   Quantitative

4. **Internode length (cm)**
   To be recorded as average of middle internodes of 5 random shoots
   
   Quantitative

5. **Tree habit**
   
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Upright</td>
</tr>
<tr>
<td>5</td>
<td>Spreading</td>
</tr>
<tr>
<td>7</td>
<td>Drooping</td>
</tr>
</tbody>
</table>

6. **Leaf shape**
   To be recorded on mature leaf
   
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ovate</td>
</tr>
<tr>
<td>2</td>
<td>Oblong</td>
</tr>
<tr>
<td>3</td>
<td>Cordate</td>
</tr>
<tr>
<td>4</td>
<td>Elliptic</td>
</tr>
<tr>
<td>5</td>
<td>Oblong lanceolate</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>
7. **Leaf margin**
   To be recorded on mature leaf
   - 1 Serrate
   - 2 Irregularly toothed
   - 3 Dentate

8. **Leaf pubescence on dorsal side**
   To be recorded on mature leaf
   - 3 Sparse
   - 5 Medium
   - 7 Dense

9. **Leaf surface colour on dorsal side**
   To be recorded on mature leaf
   - 1 Greenish white
   - 2 Light green
   - 3 Green
   - 99 Others (Specify in the 'Remarks' descriptor)

10. **Leaf length (cm)**
    To be recorded as average of 10 random leaves
    Quantitative

11. **Leaf width (cm)**
    To be recorded as average of same 10 leaves
    Quantitative

12. **Inflorescence type**
    To be recorded during flowering
    - 1 Axillary cyme
    - 2 Leaf opposed cyme
    - 3 Axillary clusters

13. **Number of flowers per inflorescence**
    To be recorded as average of 5 random inflorescences during flowering
    Quantitative

14. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

15. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date
16. Petal colour
   To be recorded just after flowering
   1 Yellow
   2 Dull yellow
   99 Others (Specify in the 'Remarks' descriptor)

17. Date of 50% fruit maturity (dd/mm/yyyy)
   To be recorded as date when at least 50% fruits in a plant attain maturity

18. Number of fruit pickings
   To be recorded as the total number of ripe fruit harvest
   Quantitative

19. Fruit length (mm)
   To be recorded as average of 10 random ripe fruits
   Quantitative

20. Fruit width (mm)
   To be recorded as average of same 10 fruits
   Quantitative

21. Fruit weight (g)
   To be recorded as average of 50 random fruits
   Quantitative

22. Fruit shape
   To be recorded on ripe fruit
   1 Round
   2 Globose
   99 Others (Specify in the 'Remarks' descriptor)

23. Fruit skin colour
   To be recorded on ripe fruit
   1 Red
   2 Dark red
   3 Purple
   4 Deep purple
   99 Others (Specify in the 'Remarks' descriptor)

24. Fruit lobe
   To be recorded on ripe fruit
   0 Absent
   1 Present
25. Total soluble solids (%)
   To be measured with refractometer
   Quantitative

26. Juiciness
   To be recorded on ripe fruit
   
   3  Low
   5  Medium
   7  High

27. Seed edible quality
   To be recorded on ripe fruit
   
   0  Non edible
   1  Edible

28. Number of seeds per fruit
   To be recorded as average of seeds of same 10 fruits
   Quantitative

29. 100 seed weight (g)
   To be recorded on mature dried seed
   Quantitative

30. Productivity status
   To be recorded at the time of harvest
   
   3  Low
   5  Medium
   7  High

31. Biotic Stress Susceptibility
   Specify the infestation or infection using 1 - 9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

32. Biotic notes
   Text

33. Remarks
   Text
Pineapple (*Ananas comosus* (L.) Merrill)

Hindi: Anannas

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants in the 1st year of bearing

1. Type of planting material
   - 1 Sucker
   - 2 Slips
   - 3 Crown
   - 4 Crown slips
   - 99 Others (Specify in the 'Remarks' descriptor)

2. Plant height (cm)
   To be recorded from ground level to fruit crown top
   Quantitative

3. Stem girth (mm)
   To be measured at the base of plant
   Quantitative

4. Plant spread (cm)
   To be measured as canopy diameter (average of East - West and North - South dimensions)
   Quantitative

5. Plant habit (without fruit)
   - 3 Erect
   - 5 Normal
   - 7 Procumbent

6. Foliage attitude
   - 1 Upright
   - 3 Slightly open
   - 5 Open
   - 7 Spreading
   - 9 Drooping

7. Middle leaf colour
   To be recorded as upper surface colour of the 15th leaf from the top of the plant
   - 1 Green
   - 2 Green with yellow mottling
   - 3 Green with red mottling
   - 4 Reddish orange
   - 5 Red
   - 6 Dark red
   - 7 Purplish/pink
   - 8 Dark red purple/pink
   - 9 Silvery white
   - 99 Others (Specify in the 'Remarks' descriptor)
8. **Number of leaves per plant**  
   To be recorded as average of 10 random plants  
   Quantitative

9. **Leaf length (cm)**  
   To be recorded as average of 10 random leaves below the fruit  
   Quantitative

10. **Leaf width (cm)**  
    To be recorded as average of same 10 leaves  
    Quantitative

11. **Distribution of spines**  
    To be observed on middle leaves  
    
    1. Spines behind tip or near base only  
    2. Spines behind tip and near base  
    3. Spines along all margins  
    4. Spines occur irregularly along both margins

12. **Peduncle length (cm)**  
    To be recorded as average of 10 random peduncles at mature fruit stage  
    Quantitative

13. **Peduncle width (cm)**  
    To be recorded as average of same 10 peduncles at mature fruit stage  
    Quantitative

14. **Peduncle colour**  
    To be recorded at mature fruit stage  
    
    1. Green  
    2. Greenish yellow/red mottling  
    3. Dark green  
    4. Red  
    5. Reddish orange  
    6. Dark red  
    7. Dark red purple  
    8. Purplish pink  
    9. Silvery white  
    99. Others (Specify in the 'Remarks' descriptor)

15. **Number of peduncle slips**  
    
    0. None  
    3. Few  
    5. Medium  
    7. Abundant
16. Number of aerial suckers

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>Few</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>Abundant</td>
</tr>
</tbody>
</table>

17. Number of underground suckers (ratoons)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>Few</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>Abundant</td>
</tr>
</tbody>
</table>

18. Date of first flowering (dd/mm/yyyy)

To be recorded when untreated and unforced plant shows first flower open

Date

19. Petal colour

To be recorded during flowering

<table>
<thead>
<tr>
<th>Colour</th>
<th>Code</th>
</tr>
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<tbody>
<tr>
<td>White</td>
<td>1</td>
</tr>
<tr>
<td>Yellow</td>
<td>2</td>
</tr>
<tr>
<td>Cream</td>
<td>3</td>
</tr>
<tr>
<td>White purple</td>
<td>4</td>
</tr>
<tr>
<td>Purple</td>
<td>5</td>
</tr>
<tr>
<td>Others</td>
<td>99</td>
</tr>
</tbody>
</table>

20. Petal fusing

To be recorded during flowering

<table>
<thead>
<tr>
<th>Fusing</th>
<th>Code</th>
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<tbody>
<tr>
<td>Free</td>
<td>3</td>
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<tr>
<td>Imbricate</td>
<td>5</td>
</tr>
<tr>
<td>Adnate</td>
<td>7</td>
</tr>
</tbody>
</table>

21. Petal orientation

To be recorded during flowering

<table>
<thead>
<tr>
<th>Orientation</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>1</td>
</tr>
<tr>
<td>Closed</td>
<td>9</td>
</tr>
</tbody>
</table>

22. Fruit shape

To be recorded on maturity of fruit

<table>
<thead>
<tr>
<th>Shape</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square like</td>
<td>1</td>
</tr>
<tr>
<td>Oval</td>
<td>2</td>
</tr>
<tr>
<td>Round</td>
<td>3</td>
</tr>
<tr>
<td>Conical</td>
<td>4</td>
</tr>
<tr>
<td>Long conical</td>
<td>5</td>
</tr>
<tr>
<td>Pyramidal</td>
<td>6</td>
</tr>
<tr>
<td>Cylindrical</td>
<td>7</td>
</tr>
<tr>
<td>Cylindrical sharp taper</td>
<td>8</td>
</tr>
<tr>
<td>Pyriform</td>
<td>9</td>
</tr>
<tr>
<td>Reniform</td>
<td>10</td>
</tr>
<tr>
<td>Others</td>
<td>99</td>
</tr>
</tbody>
</table>
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

23. Fruit length (cm)
   To be recorded as average of 5 random mature fruits
   Quantitative

24. Fruit diameter (cm)
   To be recorded as average of same 5 fruits
   Quantitative

25. Fruit weight (g)
   To be recorded as average of same 5 fruits
   Quantitative

26. Ripe fruit colour
   1  Green
   2  Silvery green
   3  Yellow with green mottling
   4  Dull yellow
   5  Bright yellow
   6  Golden yellow
   8  Reddish orange
   9  Brownish
   99 Others (Specify in the 'Remarks' descriptor)

27. Ripe fruit colour homogeneity
   3  Poor
   5  Medium
   7  Good
28. **Fruit firmness**
   To be recorded on ripe fruit
   - 3: Soft
   - 5: Intermediate
   - 7: Firm

29. **Fruit skin thickness (mm)**
   To be recorded as average of same 5 fruits
   - Quantitative

30. **Pulp colour**
   To be recorded on ripe fruit
   - 1: White
   - 2: Light cream
   - 3: Cream
   - 4: Pale yellow
   - 5: Golden yellow
   - 6: Light orange
   - 7: Deep orange
   - 99: Others (Specify in the 'Remarks' descriptor)

31. **Pulp fibrousness**
   To be recorded on ripe fruit
   - 0: Absent
   - 3: Low
   - 5: Medium
   - 7: High

32. **Pulp aroma**
   To be recorded on ripe fruit
   - 3: Mild
   - 5: Moderate
   - 7: Strong

33. **Total soluble solids (%)**
   To be measured with refractometer
   - Quantitative

34. **Seediness (seed crowdness)**
   To be recorded on ripe fruit
   - 3: Few
   - 5: Medium
   - 9: Very seedy
35. Pulp texture
   To be recorded on ripe fruit
   3 Smooth
   5 Medium
   7 Rough

36. Eye pattern (eye profile)
   To be recorded on ripe fruit
   3 Flat
   5 Normal
   7 Prominent

37. Eye depth
   To be recorded on ripe fruit
   3 Shallow
   5 Medium
   7 Deep

38. Crown shape
   To be recorded on ripe fruit
   1 Cone
   2 Oblong blocky
   3 Acron (heart shaped)
   4 Long conical
   5 Lengthened cylindrical
   6 Lengthened cylindrical with bunchy top
   99 Others (Specify in the 'Remarks' descriptor)

Crown shape
39. Crown foliage attitude
1. Erect
2. Semi-erect
3. Horizontal
4. Drooping

40. Crown leaf colour
1. Greenish/green
2. Green with yellow mottling
3. Green with red mottling
4. Reddish orange
5. Red
6. Dark red
7. Purplish/pinkish
8. Dark red-purple/pink
9. Silvery white
99. Others (Specify in the 'Remarks' descriptor)

41. Presence of spines on crown leaves
1. Smooth
2. Spines at tip
3. Spiny serrate
4. Piping

42. Presence of seeds
0. Absent
1. Present

43. Seed colour
1. Grey
2. Brown
99. Others (Specify in the 'Remarks' descriptor)

44. Productivity status
To be recorded at the time of harvest
3. Low
5. Medium
7. High
45. **Biotic Stress Susceptibility**

   Specify the infestation or infection using 1 - 9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

   1. Very low or no visible sign of susceptibility
   2. Low
   3. Intermediate
   4. High
   5. Very high

46. **Biotic notes**

   Text

47. **Remarks**

   Text
Pomegranate (Punica granatum L.)

Hindi: Anar

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   99. Others (Specify in the 'Remarks' descriptor)

2. Tree height (m)
   To be measured from ground level to the tip of highest shoot
   Quantitative

3. Tree spread (m)
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

4. Tree habit
   3. Upright
   5. Spreading
   7. Drooping
   9. Compact

5. Number of stems per tree
   To be recorded as average of 5 random trees
   Quantitative

6. Tree nature
   1. Evergreen
   2. Partially deciduous
   3. Deciduous

7. Young leaf colour
   1. Light green
   2. Green
   3. Dark green
   4. Green with pink tinge
   5. Pinkish brown
8. Foliage density
   3  Sparse
   5  Medium
   7  Dense

9. Leaf length
   To be recorded as average of 10 random mature leaves
   3  Short (< 50 mm)
   5  Medium (50 mm to < 61 mm)
   7  Long (61 - 70 mm)
   9  Very long (> 70 mm)

10. Leaf width
    To be recorded as average of same 10 leaves
    1  Narrow (< 15 mm)
    2  Medium broad (15 - 20 mm)
    3  Broad (> 20 mm)

11. Thorniness
    To be recorded during flowering
    3  Less
    5  Medium
    7  High

12. Inflorescence type
    To be recorded during flowering
    1  Solitary
    2  Cymose
    3  Dichasial cyme

13. Inflorescence position
    To be recorded during flowering
    1  Terminal
    2  Leaf axil
    3  Both

14. Flower emergence site
    To be recorded during flowering
    1  On spurs
    2  On one year old shoot
    3  On current year shoot

15. Main flowering season
    1  June - July
    2  September - October
    3  February - March
16. Flowering habit
   To be recorded as number of flushes per year
   
   1  Once
   2  Twice
   3  Thrice

17. Number of male flowers per tree
    To be recorded as average of 5 random trees
    Quantitative

18. Number of female flowers per tree
    To be recorded as average of same 5 trees
    Quantitative

19. Number of hermaphrodite flowers per tree
    To be recorded as average of same 5 trees
    Quantitative

20. Date of start of female / hermaphrodite flowering (dd/mm/yyyy)
    To be recorded when 5% flower buds have opened
    Date

21. Date of end of female / hermaphrodite flowering (dd/mm/yyyy)
    To be recorded when 85-90% flower buds have opened
    Date

22. Pollination status
    1  Self pollinated
    2  Cross pollinated
    3  Often cross pollinated

23. Calyx colour
    To be recorded on fully opened flowers
    1  Yellow
    2  Red
    3  Deep red
    4  Crimson
    5  Scarlet
    99  Others (Specify in the 'Remarks' descriptor)

24. Number of fruits per cluster
    To be recorded as average of 5 random clusters
    Quantitative
25. Date of 50% fruit maturity (dd/mm/yyyy)
   To be recorded when atleast 50% fruits in a plant attains maturity

Date

26. Extent of fruit drop
   3  Low
   5  Medium
   7  High

27. Fruit shape
   To be recorded on mature fruit
   1  Round
   2  Roundish flat
   3  Oval with nipple at pedicel end
   4  Oval

28. Fruit surface
   To be recorded on mature fruit
   1  Smooth
   2  Rusted
   3  Rough

29. Fruit ridges
   To be recorded on mature fruit
   0  Absent
   1  Present

30. Fruit skin colour
   To be recorded on mature fruit
   1  Creamy white
   2  Yellow
   3  Dull red
   4  Red
   5  Deep red
   99  Others (Specify in the 'Remarks' descriptor)

31. Fruit length (cm)
   To be recorded as average of 5 random mature fruits

   Quantitative

32. Fruit width (cm)
   To be recorded as average of same 5 fruits

   Quantitative
33. **Fruit weight (g)**
   To be recorded as average of same 5 fruits
   Quantitative

34. **Number of arils per fruit**
   To be recorded as average of same 5 fruits
   Quantitative

35. **Dry weight of 100 arils (g)**
   Quantitative

36. **Aril colour**
   To be recorded on mature fruit
   1  Creamy white
   2  Yellow
   3  Light pink
   4  Pink
   5  Red
   6  Blood red
   99  Others (Specify in the ‘Remarks’ descriptor)

37. **Rind weight (g)**
   To be recorded as average of same 5 fruits
   Quantitative

38. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

39. **Acidity (%)**
   Quantitative

40. **Juice content**
   To be measured as volume (ml)/weight (g) basis on mature fruit
   Quantitative

41. **Fruit cracking (%)**
   Quantitative

42. **Seed hardness**
   1  Very soft
   3  Soft
   5  Medium hard
   7  Hard
43. **Productivity status**  
To be recorded at the time of harvest

3  Low  
5  Medium  
7  High

44. **Biotic Stress Susceptibility**  
Specify the infestation or infection using 1 - 9 scale.

Note: For additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility  
3  Low  
5  Intermediate  
7  High  
9  Very high

45. **Biotic notes**  
Text

46. **Remarks**  
Text
Sapota (*Achras zapota* L.)

**Hindi : Chiku**

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1  Seedling
   - 2  Layered
   - 3  Grafted
   - 99  Others (Specify in the ‘Remarks’ descriptor)

2. **Root stock used**
   - 1  Sapota seedling
   - 2  *Manilkara hexandra* seedling
   - 99  Others (Specify in the ‘Remarks’ descriptor)

3. **Tree height (m)**
   To be measured from the ground level to the tip of highest shoot
   Quantitative

4. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period
   Quantitative

5. **Tree habit**
   - 3  Upright
   - 5  Spreading
   - 7  Drooping

6. **Branching habit**
   - 1  In whorls
   - 2  Irregular

7. **Leaf shape**
   To be recorded on mature leaf
   - 1  Lanceolate
   - 2  Elliptic lanceolate
8. Leaf margin
To be recorded on mature leaf
1. Entire
2. Wavy
3. Crinkled

9. Leaf tip
To be recorded on mature leaf
1. Obtuse
2. Acute
3. Acuminate
10. Leaf size
   To be recorded on mature leaf
   3    Small
   5    Medium
   7    Large

11. Leaf colour
   To be recorded on mature leaf
   1    Light green
   2    Green
   3    Dark green
   99   Others (Specify in the 'Remarks' descriptor)

12. Inflorescence type
   To be recorded during flowering
   1    Solitary
   2    Cluster
   3    Both

13. Number of flower buds per cluster
   To be recorded as average of 10 random clusters
   Quantitative

14. Date of start of flowering (dd/mm/yyyy)
   To be recorded when 5% flower buds have opened
   Date

15. Date of end of flowering (dd/mm/yyyy)
   To be recorded when 85-90% flower buds have opened
   Date

16. Flowering habit
   To be recorded as number of flushes in an year
   1    Once
   2    Twice
   3    Thrice

17. Sex type
   To be recorded during flowering
   1    Harmaphrodite
   2    Male
18. Date to 50% fruit maturity (dd/mm/yyyy)
   To be recorded when at least 50% fruits in a plant show maturity
   Date

19. Fruit length (cm)
   To be recorded as average of 10 random fruits
   Quantitative

20. Fruit width (cm)
   To be recorded as average of same 10 fruits
   Quantitative

21. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative

22. Fruit shape
   To be recorded on mature fruit
   1 Round
   2 High round
   3 Elliptic
   4 Oval
   5 Oblong
   6 Acorn
   7 Turbinate

![Fruit shapes](image)
23. **Fruit skin thickness**
   To be recorded on mature fruit
   
   3  Thin
   5  Medium thick
   7  Thick

24. **Fruit skin colour**
   To be recorded on mature fruit
   
   1  Light brown
   2  Brown
   3  Dark brown

25. **Fruit ridges**
   To be recorded on mature fruit
   
   0  Absent
   1  Present

26. **Fruit skin texture**
   To be recorded on mature fruit
   
   1  Smooth
   2  Medium
   3  Rough

27. **Flakes intensity on surface**
   To be recorded on mature fruit
   
   3  Low
   5  Medium
   7  High

28. **Pulp colour**
   To be recorded on mature fruit
   
   1  Creamy
   2  Golden
   3  Reddish brown
   4  Brownish
   99  Others (Specify in the 'Remarks' descriptor)

29. **Pulp firmness**
   To be recorded on mature fruit
   
   3  Soft
   5  Medium soft
   7  Firm
30. Fruit base shape
To be recorded on mature fruit

1  Depressed
2  Flattened
3  Inflated
4  Pointed
99  Others (Specify in the 'Remarks' descriptor)

31. Fruit apex shape
To be recorded on mature fruit

1  Rounded
2  Broadly pointed
3  Conical
99  Others (Specify in the 'Remarks' descriptor)

32. Pulp texture
To be recorded on mature fruit

1  Soft
2  Granular
3  Gritty
4  Mealy

33. Pulp juiciness
To be recorded on mature fruit

3  Less
5  Medium
7  High

34. Pulp aroma
To be recorded on mature fruit

1  Very low
3  Low
5  Medium
7  High
35. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

36. **Number of seeds per fruit**
   To be recorded as average of seeds of same 10 fruits
   Quantitative

37. **Seed length (mm)**
   To be recorded as average of 10 random seeds
   Quantitative

38. **Seed width (mm)**
   To be recorded as average of same 10 seeds
   Quantitative

39. **Seed colour**
   To be recorded on mature fruit
   1. Light brown
   2. Dark brown
   3. Black

40. **Productivity status**
   To be recorded at the time of harvest
   3. Low
   5. Medium
   7. High

41. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1 - 9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1. Very low or no visible sign of susceptibility
   3. Low
   5. Intermediate
   7. High
   9. Very high

42. **Biotic notes**
   Text

43. **Remarks**
   Text
TEMPERATE FRUITS
Almond (*Prunus amygdalus* Batsch.)

Hindi: Badam

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Cutting</td>
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<tr>
<td>3</td>
<td>Layered</td>
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<tr>
<td>4</td>
<td>Grafted</td>
</tr>
<tr>
<td>5</td>
<td>Budded</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
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2. **Rootstock used**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Sweet almond seedling</td>
</tr>
<tr>
<td>2</td>
<td>Bitter almond seedling</td>
</tr>
<tr>
<td>3</td>
<td>Peach seedling</td>
</tr>
<tr>
<td>4</td>
<td>Plum seedling</td>
</tr>
<tr>
<td>5</td>
<td>Peach clonal</td>
</tr>
<tr>
<td>6</td>
<td>Plum clonal</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

3. **Tree height (m)**

   To be measured from ground level to the tip of the highest shoot during dormant season

   Quantitative

4. **Trunk girth (cm)**

   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormant season

   Quantitative

5. **Tree spread (m)**

   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period

   Quantitative
6. Tree habit

1. Upright
2. Spreading
3. Drooping
4. Weeping

Tree habit

7. Shoot tip colour
To be recorded as anthocyanin pigmentation on current season's shoot

0. Absent
3. Low
5. Intermediate
7. High

8. Leaf length (cm)
To be recorded as average of 10 random leaves
Quantitative

9. Leaf width (cm)
To be recorded as average of same 10 leaves
Quantitative

10. Flower bud position
To be recorded during flowering

1. Most flower buds on one year shoot
2. Most flower buds on spur
3. Both
11. **Date of start of flowering (dd/mm/yyyy)**
   To be recorded when 5% flower buds have opened
   Date

12. **Date of end of flowering (dd/mm/yyyy)**
   To be recorded when 85-90% flower buds have opened
   Date

13. **Petal colour**
   To be recorded at the time of flowering
   1. White
   2. Pink
   99 Others (Specify in the ‘Remarks’ descriptor)

14. **Dichogamy**
   1. Protandrous
   2. Protogynous

15. **Self compatibility**
   1. Self pollinated
   2. Partially - self pollinated
   3. Partially - cross pollinated
   4. Cross pollinated

16. **Sex form**
   To be recorded at the time of flowering
   1. Staminate
   2. Pistillate
   3. Hermaphrodite

17. **Date of harvesting (dd/mm/yyyy)**
   To be recorded when hull dehiscence takes place
   Date

18. **Nut length (mm)**
   To be recorded as average of 10 random mature nuts
   Quantitative

19. **Nut width (mm)**
   To be recorded as average of same 10 nuts
   Quantitative

20. **Nut weight (g)**
   To be recorded as average of same 10 nuts
   Quantitative
21. Nut shape
To be recorded on mature nut
1 Round
2 Ovate
3 Oblong
4 Cordate
5 Extremely narrow
99 Others (Specify in the 'Remarks' descriptor)

22. Shell suture
To be recorded on mature nut
1 Weak
2 Intermediate
3 Strong

23. Marking on outer shell
To be recorded on mature nut
0 Without pores
3 Sparsely pores
5 Intermediate
7 Densely pores
9 Scribed

24. Shell thickness (mm)
To be recorded as average of same 10 nuts
Quantitative

25. Shell weight (g)
To be recorded as average of same 10 nuts
Quantitative
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

Marking on outer shell

26. Shell softness
To be recorded on mature nut

1 Paper shelled
3 Soft
5 Hard
7 Very hard

27. Kernel weight (g)
To be recorded as average of kernels of same 10 nuts
Quantitative

28. Kernel shape
To be recorded on mature nut

3 Narrow
5 Intermediate
7 Broad

29. Kernel colour intensity
To be recorded on mature nut

1 Very light
3 Light
5 Medium
7 Dark
9 Very dark

30. Kernel surface
To be recorded on mature nut

1 Smooth
2 Rough
3 Wrinkled

3 Sparsely pored 5 Intermediate 7 Densely pored 9 Scribed

SHL-SOFT
KER-WT
KER-SHP
KER-CLRI
KER-SRFE
Almond (Prunus amygdalus Batsch.)

31. Kernel taste
To be recorded on mature nut

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>Tasteless</td>
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<tr>
<td>3</td>
<td>Bitter</td>
</tr>
<tr>
<td>5</td>
<td>Moderately sweet</td>
</tr>
<tr>
<td>7</td>
<td>Sweet</td>
</tr>
</tbody>
</table>

32. Productivity status
To be recorded at the time of harvest

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>3</td>
<td>Low</td>
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<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

33. Biotic Stress Susceptibility
Specify the infestation or infection using 1 - 9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Very low or no visible sign of susceptibility</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

34. Biotic notes
Text

35. Remarks
Text
**Apple (Malus pumila Mill.)**  
Hindi: Seb

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**  
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1: Seedling
   - 2: Cutting
   - 3: Layered
   - 4: Grafted
   - 5: Budded
   - 99: Others (Specify in the 'Remarks' descriptor)

2. **Root stock used**
   - 1: Seedling
   - 2: Clonal
   - 99: Others (Specify in the 'Remarks' descriptor)

3. **Tree height (m)**  
   To be measured from ground level to the tip of the highest shoot during dormancy  
   Quantitative

4. **Trunk girth (cm)**  
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy  
   Quantitative

5. **Tree spread (m)**  
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period  
   Quantitative

6. **Tree habit**  
   To be recorded during active growth period
   - 3: Upright
   - 5: Spreading
   - 7: Drooping
7. Tree vigour
   To be recorded during active growth period
   1. Extremely weak
   3. Weak
   5. Intermediate
   7. Vigorous
   9. Very vigorous

8. Leaf size
   To be recorded on mature leaf
   3. Small
   5. Medium
   7. Large

9. Leaf shape
   To be recorded on mature leaf
   1. Oval
   2. Ovate
   3. Broad elliptic
   99. Others (Specify in the 'Remarks' descriptor)

10. Number of flower buds per inflorescence
    To be recorded as average of 10 random inflorescences
    Quantitative

11. Flower stalk (pedicel) length (mm)
    To be recorded as average of 10 random stalks
    Quantitative

12. Date of start of flowering (dd/mm/yyyy)
    To be recorded when 5% buds have opened
    Date

13. Date of end of flowering (dd/mm/yyyy)
    To be recorded when 85-90% buds have opened
    Date

14. Regularity of flowering
    1. Regular
    2. Biennial
    3. Irregular

15. Self compatibility
    1. Incompatible
    2. Partially compatible
    3. Compatible
16. **Bearing habit**
   To be recorded during flowering stage
   1. On spurs
   2. On shoot tips
   3. On old shoots
   4. Mixed

17. **Age of first bearing (years)**
   To be recorded as number of years to attain first fruiting
   Quantitative

18. **Days to fruit harvest**
   To be recorded as number of days from date of end of flowering to date of harvest
   Quantitative

19. **Fruit shape**
   To be recorded on mature fruit
   1. Globose
   2. Globose-conical
   3. Short-globose-conical
   4. Flat
   5. Flat-globose (oblate)
   6. Conical
   7. Long-conical
   8. Intermediate-conical
   9. Ellipsoid
   10. Ellipsoid-conical (Ovate)
   11. Oblong
   12. Oblong-conical
   13. Oblong-waisted
   99. Other (Specify in the ‘Remarks’ descriptor)

20. **Fruit base**
   To be recorded on mature fruit
   3. Narrow
   5. Intermediate
   7. Broad

21. **Fruit base cavity depth**
   To be recorded on mature fruit
   3. Shallow
   5. Medium
   7. Deep
22. **Fruit apex**
To be recorded on mature fruit

1  Smooth
2  Wrinkled
3  Grooved
99  Others (Specify in the 'Remarks' descriptor)

23. **Fruit length (cm)**
To be recorded as average of 10 random mature fruits
Quantitative

24. **Fruit width (cm)**
To be recorded as average of same 10 fruits
Quantitative

25. **Fruit weight (g)**
To be recorded as average of same10 fruits
Quantitative
26. **Fruit ground colour**
   To be recorded as skin colour of fully mature fruit
   1. Cream white
   2. Yellow
   3. Green yellow
   4. Green
   5. Orange
   6. Red
   99. Others (Specify in the 'Remarks' descriptor)

27. **Fruit over colour**
   To be recorded as skin colour of fully mature fruit
   1. Yellow (golden)
   2. Pink
   3. Green
   4. Orange
   5. Red
   6. Dark red
   7. Brown
   8. Purple
   9. Dark brown
   99. Others (Specify in the 'Remarks' descriptor)

28. **Fruit skin lenticel**
    To be recorded on mature fruit
    0. Absent
    3. Low
    5. Medium
    7. High

29. **Pulp texture**
    To be recorded on mature fruit
    3. Soft
    5. Intermediate
    7. Firm

30. **Pulp taste**
    To be recorded on mature fruit
    1. Acidic
    2. Sub acidic
    3. Medium sweet
    4. Sweet
31. **Juiciness**
   To be recorded on mature fruit
   
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>Less</td>
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<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

32. **Total soluble solids (%)**
   To be measured with refractometer
   
   Quantitative

33. **Productivity status**
   To be recorded at the time of harvest
   
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tr>
<td>3</td>
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<td>Medium</td>
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<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

34. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1 - 9 scale.
   
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
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<tbody>
<tr>
<td>1</td>
<td>Very low or no visible sign of susceptibility</td>
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<td>3</td>
<td>Low</td>
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<tr>
<td>5</td>
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<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

35. **Biotic notes**
   Text

36. **Remarks**
   Text
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

Apricot (Prunus armeniaca L.)
Hindi : Khubani

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1 Seedling
   - 2 Cutting
   - 3 Layered
   - 4 Grafted
   - 5 Budded
   - 99 Others (Specify in the 'Remarks' descriptor)

2. Root stock used
   - 1 Apricot seedling
   - 2 Clonal
   - 99 Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   To be measured from ground level to the tip of the highest shoot during dormancy
   Quantitative

4. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy
   Quantitative

5. Tree spread (m)
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

6. Tree habit
   To be recorded during active growth period
   - 3 Upright
   - 5 Spreading
   - 7 Drooping
7. **Shoot tip pigmentation**
   To be recorded as pigmentation of 10-15 cm long young shoot in spring season
   0 Absent
   3  Less
   5  Medium
   7  High

8. **Leaf size**
   To be recorded on mature leaf
   3  Small
   5  Intermediate
   7  Large

9. **Petiole gland**
   To be recorded on mature leaf
   0  Absent
   1  Usually 1 - 2
   2  Usually > 2 to 3
   3  Usually > 3

10. **Pollination status**
    1  Partially self pollinated
    2  Self pollinated
    3  Partially cross pollinated
    4  Cross pollinated

11. **Flower type**
    1  Staminate
    2  Pistillate
    3  Hermaphrodite

12. **Petal colour**
    To be recorded on just opened flower
    1  Whitish
    2  Creamy white
    3  Pinkish
    99  Others (Specify in the 'Remarks' descriptor)

13. **Date of start of flowering** (dd/mm/yyyy)
    To be recorded when 5% flower buds have opened
    Date

14. **Date of end of flowering** (dd/mm/yyyy)
    To be recorded when 85-90% flower buds have opened
    Date
15. Fruit shape
To be recorded on mature fruit

1  Flat
2  Round
3  Oblong
4  Elliptical
5  Ovate
99 Others (Specify in the 'Remarks' descriptor)

16. Fruit ground colour
To be recorded on mature fruit

1  White
2  Creamy white
3  Creamy
4  Light yellow
5  Yellow
6  Light green
99 Others (Specify in the 'Remarks' descriptor)

17. Fruit over colour
To be recorded on mature fruit

1  White
2  Light cream
3  Cream
4  Yellow
5  Light orange
6  Orange
7  Deep orange
99 Others (Specify in the 'Remarks' descriptor)
18. **Fruit length (mm)**  
   To be recorded as average of 10 random mature fruits  
   Quantitative

19. **Fruit width (mm)**  
   To be recorded as average of same 10 fruits  
   Quantitative

20. **Fruit weight (g)**  
   To be recorded as average of same 10 fruits  
   Quantitative

21. **Pulp colour**  
   To be recorded on mature fruit  
   1 White  
   2 Light cream  
   3 Cream  
   4 Yellow  
   5 Light orange  
   6 Orange  
   7 Deep orange  
   8 Red  
   99 Others (Specify in the 'Remarks' descriptor)

22. **Pulp firmness**  
   To be recorded on mature fruit  
   3 Soft  
   5 Medium  
   7 Firm

23. **Fruit taste**  
   To be recorded on mature fruit  
   1 Acidic  
   2 Sub acidic  
   3 Sweet  
   4 Very sweet

24. **Total soluble solids (%)**  
   To be measured with refractometer  
   Quantitative

25. **Stone size**  
   To be recorded on mature fruit  
   3 Small  
   5 Medium  
   7 Large
26. Stone adherence to pulp
   To be recorded on mature fruit
   3  Cling
   5  Semi - cling
   7  Free

27. Kernel length (mm)
   To be recorded as average of kernels of same 10 fruits
   Quantitative

28. Kernel width (mm)
   To be recorded as average of same 10 kernels
   Quantitative

29. Kernel weight (g)
   To be recorded as average of same 10 kernels
   Quantitative

30. Kernel taste
   To be recorded on mature fruits
   1  Sweet
   2  Tasteless
   3  Bitter

31. Productivity status
   To be recorded at the time of harvest
   3  Low
   5  Medium
   7  High

32. Biotic Stress Susceptibility
   Specify the infestation or infection using 1 - 9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

33. Biotic notes
   Text

34. Remarks
   Text
Cherry (*Prunus* species)

Hindi: Cherry

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   - To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   
<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seedling</td>
</tr>
<tr>
<td>2</td>
<td>Cutting</td>
</tr>
<tr>
<td>3</td>
<td>Layered</td>
</tr>
<tr>
<td>4</td>
<td>Grafted</td>
</tr>
<tr>
<td>5</td>
<td>Budded</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

2. **Root stock used**

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cherry seedling</td>
</tr>
<tr>
<td>2</td>
<td>Clonal</td>
</tr>
<tr>
<td>99</td>
<td>Others (Specify in the 'Remarks' descriptor)</td>
</tr>
</tbody>
</table>

3. **Tree height (m)**
   - To be measured from ground level to the tip of the highest shoot during dormancy

4. **Trunk girth (cm)**
   - To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy

5. **Tree spread (m)**
   - To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period

6. **Tree habit**
   - To be recorded during active growth period

<table>
<thead>
<tr>
<th>Code</th>
<th>Habit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Upright</td>
</tr>
<tr>
<td>5</td>
<td>Spreading</td>
</tr>
<tr>
<td>7</td>
<td>Drooping</td>
</tr>
</tbody>
</table>
7. **Rootstock-scion compatibility**
   - **3** Poor
   - **5** Intermediate
   - **7** Good

8. **Inflorescence position**
   To be recorded during flowering
   - **1** On spurs
   - **2** On shoots
   - **99** Others (Specify in the 'Remarks' descriptor)

9. **Date of start of flowering (dd/mm/yyyy)**
   To be recorded when 5% flower buds have opened
   
   **Date**

10. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    
    **Date**

11. **Pollination status**
    - **1** Self pollinated
    - **2** Partially self pollinated
    - **3** Partially cross pollinated
    - **4** Cross pollinated

12. **Days to fruit harvest**
    To be recorded as number of days from date of end of flowering to date of harvest
    
    **Quantitative**

13. **Fruit length (mm)**
    To be recorded as average of 10 random mature fruits
    
    **Quantitative**

14. **Fruit width (mm)**
    To be recorded as average of same 10 fruits
    
    **Quantitative**

15. **Fruit weight (g)**
    To be recorded as average of same 10 fruits
    
    **Quantitative**

16. **Fruit size**
    To be recorded on mature fruit
    - **1** Very small
    - **3** Small
    - **5** Medium
    - **7** Large
    - **9** Very large
17. Fruit shape
To be recorded on mature fruit

1    Kidney shaped
2    Flat round
3    Round
4    Elongate
5    Cordate
99   Others (Specify in the 'Remarks' descriptor)

1 Kidney-shaped  2 Flat-round  3 Round

4 Elongate  5 Cordate

18. Fruit skin colour
To be recorded on mature fruit

1    Cream white
2    Pink
3    Red
4    Dark red
5    Black red
99   Others (Specify in the 'Remarks' descriptor)

19. Juice colour
To be recorded on mature fruit

0    Colourless
1    Pink
2    Red
3    Purple dark red
4    Black red
99   Others (Specify in the 'Remarks' descriptor)
20. **Pulp firmness**
   To be recorded on mature fruit
   3    Soft
   5    Intermediate
   7    Firm

21. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

22. **Fruit taste**
   To be recorded on mature fruit
   1    Extremely poor
   3    Poor
   5    Fair
   7    Good
   9    Very good

23. **Stone length (mm)**
   To be recorded as average of stones of same 10 fruits
   Quantitative

24. **Stone width (mm)**
   To be recorded as average of same 10 stones
   Quantitative

25. **Stone weight (g)**
   To be recorded as average of same 10 stones
   Quantitative

26. **Pulp-stone ratio**
   To be calculated as ratio of fruit weight to stone weight
   Quantitative

27. **Stone shape**
   To be recorded on mature fruit
   1    Spherical
   2    Intermediate
   3    Elongate
28. Skin cracking
To be recorded on mature fruit

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
</tr>
<tr>
<td>3</td>
<td>Less</td>
</tr>
<tr>
<td>5</td>
<td>Moderate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

29. Productivity status
To be recorded at the time of harvest

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

30. Biotic Stress Susceptibility
Specify the infestation or infection using 1-9 scale.

Note: For additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very low or no visible sign of susceptibility</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

31. Biotic notes
Text

32. Remarks
Text
Peach (*Prunus persica* L.)
Hindi : Aadu

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   - 1. Seedling
   - 2. Cutting
   - 3. Layered
   - 4. Grafted
   - 5. Budded
   - 99. Others (Specify in the ‘Remarks’ descriptor)

2. **Rootstock used**
   - 1. Peach seedling
   - 2. Plum seedling
   - 3. Apricot seedling
   - 4. Almond seedling
   - 5. Clonal
   - 99. Others (Specify in the ‘Remarks’ descriptor)

3. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot during dormancy
   Quantitative

4. **Tree girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy
   Quantitative

5. **Tree spread (m)**
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

6. **Tree habit**
   To be recorded during active growth period
   - 3. Upright
   - 5. Spreading
   - 7. Drooping
7. **Leaf colour**
   To be recorded on mature leaf
   
   - 1  Light green
   - 2  Green
   - 3  Pinkish
   - 99 Others (Specify in the ‘Remarks’ descriptor)

8. **Petiole gland**
   To be recorded on mature leaf
   
   - 0  Absent
   - 1  Reniform
   - 2  Globose

9. **Flower size**
   To be recorded during flowering
   
   - 3  Small
   - 5  Intermediate
   - 7  Large

10. **Self compatibility**
    
    - 1  Compatible
    - 2  Incompatible
    - 99 Others (Specify in the ‘Remarks’ descriptor)

11. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened

    Date

12. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened

    Date

13. **Petal colour**
    To be recorded on just opened flower
    
    - 1  White
    - 2  Yellowish
    - 3  Pink
    - 4  Red
    - 99 Others (Specify in the ‘Remarks’ descriptor)

14. **Days to fruit harvest**
    To be recorded as number of days from date of end of flowering to date of harvest

    Quantitative
15. **Fruit length (cm)**
   To be recorded as average of 10 random mature fruits
   Quantitative

16. **Fruit width (cm)**
   To be recorded as average of same 10 fruits
   Quantitative

17. **Fruit weight (g)**
   To be recorded as average of same 10 fruits
   Quantitative

18. **Fruit shape**
   To be recorded on mature fruit
   1 Very flat
   2 Slightly flat
   3 Rounded
   4 Ovate
   5 Oblong
   6 Elongated
   99 Others (Specify in the 'Remarks' descriptor)

![Fruit shape diagrams]

19. **Fruit suture**
   To be recorded on mature fruit
   3 Shallow
   5 Medium
   7 Deep
20. **Fruit skin colour**
To be recorded on mature fruit

1. Yellow
2. Light pinkish
3. Partially red
4. Red
5. Red striped
99. Others (Specify in the ‘Remarks’ descriptor)

21. **Fruit fuzz**
To be recorded on mature fruit

0. Absent
1. Present

22. **Fruit firmness**
To be recorded on mature fruit

3. Soft
5. Medium
7. Firm

23. **Pulp colour**
To be recorded on mature fruit

1. White
2. Cream
3. Yellow
4. Deep yellow
5. Greenish white
99. Others (Specify in the ‘Remarks’ descriptor)

24. **Pulp texture**
To be recorded on mature fruit

1. Fine
2. Intermediate
3. Coarse

25. **Fruit juiciness**
To be recorded on mature fruit

3. Less
5. Medium
7. High
9. Very high

26. **Total soluble solids (%)**
To be measured with refractometer

Quantitative
27. **Stone length (cm)**
   To be recorded as average of stones of same 10 fruits
   Quantitative

28. **Stone width (mm)**
   To be recorded as average of same 10 stones
   Quantitative

29. **Stone weight (g)**
   To be recorded as average of same 10 stones
   Quantitative

30. **Stone shape**
   1. Flat
   2. Rounded
   3. Ovoid
   4. Elongated
   5. Very elongated
   99. Others (Specify in the 'Remarks' descriptor)

31. **Stone adherence to pulp**
   To be recorded on mature fruit
   1. Cling stone
   2. Partially cling stone
   3. Partially free stone
   4. Free stone

32. **Pulp - stone ratio**
   To be calculated as ratio of fruit weight to stone weight
   Quantitative
33. **Productivity status**
   To be recorded at the time of harvest
   
   3  Low
   5  Medium
   7  High

34. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1 - 9 scale.
   
   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

35. **Biotic notes**
   Text

36. **Remarks**
   Text
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

Pear (*Pyrus communis* L.)
Hindi : Nashpati

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   - To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Layered
   3. Grafted
   4. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Rootstock used
   - 1. Pear seedling
   2. Clonal
   3. Wild species
   99. Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   - To be measured from ground level to the tip of the highest shoot during dormancy
   Quantitative

4. Trunk girth (cm)
   - To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy
   Quantitative

5. Tree spread (m)
   - To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

6. Tree habit
   - To be recorded during active growth period
   3. Upright
   5. Spreading
   7. Drooping
7. **Tree vigour**
   To be recorded during active growth period
   1. Extremely weak
   3. Weak
   5. Intermediate
   7. Vigorous
   9. Very vigorous

8. **Leaf size**
   To be recorded on mature leaf
   3. Small
   5. Medium
   7. Large

9. **Leaf shape**
   To be recorded on mature leaf
   1. Ovate - oblong
   2. Orbicular - ovate
   3. Elliptic
   4. Lanceolate
   99. Others (Specify in the 'Remarks' descriptor)

10. **Leaf margin**
    To be recorded on mature leaf
    1. Entire
    2. Serrate
    3. Dentate
    4. Serrulate
    99. Others (Specify in the 'Remarks' descriptor)

11. **Number of flower buds per inflorescence**
    To be recorded as average of 10 random inflorescences
    Quantitative

12. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

13. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date
14. Flower size
   To be recorded during flowering
   3 Small
   5 Intermediate
   7 Large

15. Flower stalk length (mm)
   To be recorded as average of 10 random flower stalks
   Quantitative

16. Bearing habit
   To be recorded during flowering
   1 On spurs
   2 On old shoots
   3 On shoot tip
   4 On old shoots and shoot tip

17. Age of first bearing (years)
   To be recorded as number of years to attain first fruiting
   Quantitative

18. Pollination behaviour
   1 Self unfruitful
   2 Partially self fruitful
   3 Self fruitful

19. Nature of calyx
   To be recorded on mature fruit
   1 Persistent
   2 Deciduous

20. Days to fruit harvest
    To be recorded as number of days from date of end of flowering to date of harvest
    Quantitative

21. Fruit shape
    To be recorded on mature fruit
    1 Round
    2 Globose
    3 Oblong ovate
    4 Pyriform
    5 Ovate pyriform
    6 Pyriform with narrow neck
    99 Others (Specify in the 'Remarks' descriptor)
22. Peduncle length (mm)
   To be recorded as average of 10 random peduncles
   Quantitative

23. Fruit length (cm)
   To be recorded as average of 10 random fruits
   Quantitative

24. Fruit width (cm)
   To be recorded as average of same 10 fruits
   Quantitative

25. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative

26. Fruit ground colour
   To be recorded on mature fruit
   1  Red
   3  Yellow
   5  Green yellow
   7  Green
   99  Others (Specify in the ‘Remarks’ descriptor)

27. Fruit over colour
   To be recorded on mature fruit
   1  Bright yellow
   2  Yellowish green
   3  Yellow with pinkish tinge
   4  Yellow with brown russet
   5  Greenish yellow
   6  Brownish
   7  Dark brown
   8  Fully russet
   99  Others (Specify in the ‘Remarks’ descriptor)

28. Fruit surface texture
   To be recorded on mature fruit
   3  Smooth
   5  Medium rough
   7  Rough
29. Pulp texture
   To be recorded on mature fruit
   3 Melting
   5 Soft
   7 Medium
   9 Hard

30. Grittiness
   To be recorded on mature fruit
   3 Low
   5 Medium
   7 High

31. Pulp colour
   To be recorded on mature fruit
   1 White
   2 Creamy
   99 Others (Specify in the 'Remarks' descriptor)

32. Total soluble solids (%)
   To be measured with refractometer
   Quantitative

33. Pulp juiciness
   To be recorded on mature fruit
   3 Less
   5 Medium
   7 High
   9 Very high

34. Pulp taste
   To be recorded on mature fruit
   1 Acidic
   2 Sub acidic
   3 Medium sweet
   4 Sweet
   5 Highly sweet

35. Productivity status
   To be recorded at the time of harvest
   3 Low
   5 Intermediate
   7 High
36. Biotic Stress Susceptibility

Specify the infestation or infection using 1 - 9 scale.

Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

1  Very low or no visible sign of susceptibility
3  Low
5  Intermediate
7  High
9  Very high

37. Biotic notes

Text

38. Remarks

Text
Plum (*Prunus domestica* L.)
Hindi: Aloobukhara

*Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.*

1. **Type of planting material**
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Cutting
   3. Layered
   4. Grafted
   5. Budded
   99 Others (Specify in the 'Remarks' descriptor)

2. **Rootstock used**
   1. Plum seedling
   2. Peach seedling
   3. Apricot seedling
   4. Clonal
   99 Others (Specify in the 'Remarks' descriptor)

3. **Tree height (m)**
   To be measured from ground level to the tip of the highest shoot during dormancy

   Quantitative

4. **Trunk girth (cm)**
   To be measured at 25 cm above the ground level in case of trees raised from seed/layering/cutting and at 15 cm above the graft union in grafted/budded ones during dormancy

   Quantitative

5. **Tree spread (m)**
   To be measured as canopy diameter (average of East - West and North - South dimensions) during active growth period

   Quantitative

6. **Tree habit**
   To be recorded during active growth period
   3. Upright
   5. Spreading
   - Drooping
7. **Leaf colour**  
To be recorded on mature leaf  
1. Light green  
2. Green  
3. Dark green  
4. Light brown  
99. Others (Specify in the 'Remarks' descriptor)

8. **Shoot tip colour**  
To be recorded on 10-15 cm long young shoots in spring season  
1. Yellowish green  
2. Green  
3. Reddish green  
4. Brownish green  
5. Violet green  
6. Brownish red  
7. Brown  
8. Brownish violet  
9. Violet red  
99. Others (Specify in the 'Remarks' descriptor)

9. **Inflorescence position**  
To be recorded during flowering  
1. On spurs  
2. On main trunk  
3. One year old shoot  
4. On terminals  
99. Others (Specify in the 'Remarks' descriptor)

10. **Flower size**  
To be recorded during flowering  
1. Very small  
3. Small  
5. Intermediate  
7. Large  
9. Very large

11. **Pollination status**  
1. Partially self pollinated  
2. Self pollinated  
3. Partially cross pollinated  
4. Cross pollinated

12. **Date of start of flowering (dd/mm/yyyy)**  
To be recorded when 5% flower buds have opened  
Date
13. Date of end of flowering (dd/mm/yyyy)
   To be recorded when 85-90% flower buds have opened
   Date

14. Fruit length (mm)
   To be recorded as average of 10 random mature fruits
   Quantitative

15. Fruit width (mm)
   To be recorded as average of same 10 fruits
   Quantitative

16. Fruit weight (g)
   To be recorded as average of same 10 fruits
   Quantitative

17. Fruit shape
   To be recorded on mature fruit
   1  Rounded flat
   2  Rounded
   3  Elliptic
   4  Ovate
   5  Heart shape
   6  Oblong
   99  Others (Specify in the 'Remarks' descriptor)

18. Fruit colour
   To be recorded as skin colour of mature fruit
   1  Green
   2  Pink
   3  Red
   4  Red-violet
   5  Violet
   6  Dark violet
   7  Blue
   8  Dark blue
   9  Black
   99  Others (Specify in the 'Remarks' descriptor)

19. Fruit bloom intensity
   To be recorded on mature fruit
   3  Low
   5  Medium
   7  High
20. Pulp texture
To be recorded on mature fruit
3 Fine
5 Intermediate
7 Coarse

21. Fruit taste
To be recorded on mature fruit
1 Acidic
2 Sub acidic
3 Medium sweet
4 Sweet

22. Total soluble solids (%)
To be recorded with refractometer
Quantitative

23. Fruit juiciness
To be recorded on ripe fruit
0 Almost dry
3 Less juicy
5 Juicy
7 Very juicy

24. Stone shape
To be recorded as lateral view of stone
1 Rounded flat
2 Rounded
3 Ovate
4 Elongated
99 Others (Specify in the 'Remarks' descriptor)
MINIMAL DESCRIPTORS OF AGRI-HORTICULTURAL CROPS

25. Stone adherence to pulp
   To be recorded on mature fruit
   1 Cling
   2 Partially cling
   3 Free

26. Stone weight (g)
   To be recorded as average of stones of same 10 fruits
   Quantitative

27. Productivity status
   To be recorded at the time of harvest
   3 Low
   5 Medium
   7 High

28. Biotic Stress Susceptibility
   Specify the infestation or infection using 1 - 9 scale.
   Note: For Additional information as common name(s) of disease(s)/pest(s) and
   causal organism(s) may be appended in the Biotic notes descriptor.
   1 Very low or no visible sign of susceptibility
   3 Low
   5 Intermediate
   7 High
   9 Very high

29. Biotic notes
   Text

30. Remarks
   Text
Strawberry (*Fragaria chiloensis* )

Hindi : Strawberry

Descriptors to be recorded on unpruned, untrained plants in the 1st year of bearing with optimal management practices.

1. **Plant height (cm)**
   - To be measured from ground level to the tip of the highest leaf
   - Quantitative

2. **Plant spread (cm)**
   - To be measured as canopy diameter (average of East - West and North - South dimensions)
   - Quantitative

3. **Number of runners per plant**
   - To be recorded as average of 5 random plants
   - Quantitative

4. **Leaf colour**
   - To be recorded on mature leaf
   - 1  Yellowish green
   - 2  Light green
   - 3  Green
   - 4  Dark green
   - 5  Green with red tinge
   - 6  Green with purplish tinge
   - 99 Others (Specify in the ‘Remarks’ descriptor)

5. **Terminal leaflet length (mm)**
   - To be recorded as average of 5 random terminal leaves
   - Quantitative

6. **Terminal leaflet width (mm)**
   - To be measured at the broadest point of the same 5 leaves
   - Quantitative

7. **Leaflet margin**
   - To be recorded on mature leaf
   - 1  Serrate
   - 2  Serrulate
   - 99 Others (Specify in the ‘Remarks’ descriptor)
8. **Leaf petiole length (mm)**
   To be recorded as average of 5 random petioles
   Quantitative

9. **Number of flower trusses per plant**
   To be recorded as average of same 5 plants
   Quantitative

10. **Number of flowers per truss**
    To be recorded as average of 5 random trusses
    Quantitative

11. **Flower type**
    To be recorded during flowering
    1. Staminate
    2. Pistillate
    3. Perfect with few stamens
    4. Perfect (hermaphrodite)

12. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date

13. **Date of end of flowering (dd/mm/yyyy)**
    To be recorded when 85-90% flower buds have opened
    Date

14. **Date of first fruit maturity (dd/mm/yyyy)**
    To be recorded when first fruit attains maturity
    Date

15. **Date of last fruit maturity (dd/mm/yyyy)**
    To be recorded when last fruit attains maturity
    Date

16. **Fruit shape**
    To be recorded on mature fruit
    1. Round
    2. Globose
    3. Oblong
    4. Conical (Heart shaped)
    5. Elliptical
    99. Others (Specify in the 'Remarks' descriptor)
17. **Fruit length (mm)**
   To be recorded as average of 10 random mature fruits
   Quantitative

18. **Fruit width (mm)**
   To be recorded as average of same 10 fruits
   Quantitative

19. **Fruit weight (g)**
   To be recorded as average of same 10 fruits
   Quantitative

20. **Yield per plant (g)**
   To be recorded as average of same 5 plants
   Quantitative

21. **Number of fruits per plant**
   To be calculated on the basis of yield per plant and fruit weight
   Quantitative

22. **Fruit skin colour**
   To be recorded on mature fruit
   - 1 Creamy white with red tinge
   - 2 Orange cream with red tinge
   - 3 Pink
   - 4 Dull red
   - 99 Others (Specify in the 'Remarks' descriptor)

23. **Fruit flavour**
   To be recorded on mature fruit
   - 3 Mild
   - 5 Moderate
   - 7 Strong

24. **Total soluble solids (%)**
   To be measured with refractometer
   Quantitative

25. **Fruit taste**
   To be recorded on mature fruit
   - 3 Poor
   - 5 Medium
   - 7 Good
   - 9 Excellent
26. **Productivity status**
   To be recorded at the time of harvest
   
   3  Low
   5  Medium
   7  High

27. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1 - 9 scale.

   Note: For Additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.

   1  Very low or no visible sign of susceptibility
   3  Low
   5  Intermediate
   7  High
   9  Very high

28. **Biotic notes**
   Text

29. **Remarks**
   Text
Walnut (Juglans regia L.)
Hindi: Akhrot

Descriptors to be recorded on unpruned, untrained, non-juvenile trees/plants for growth characters and for fruiting in the 3rd year of bearing with optimal management practices.

1. Type of planting material
   To be ensured that for growing the seedling rootstock, the seeds must be collected from a single tree as far as possible
   1. Seedling
   2. Grafted
   3. Budded
   99. Others (Specify in the 'Remarks' descriptor)

2. Root stock used
   1. Walnut seedling
   99. Others (Specify in the 'Remarks' descriptor)

3. Tree height (m)
   To be measured from ground level to the tip of the highest shoot during dormant season
   Quantitative

4. Trunk girth (cm)
   To be measured at 25 cm above the ground level in case of trees raised from seed and at 15 cm above the graft union in grafted/budded ones during dormant season
   Quantitative

5. Tree spread (m)
   To be measured as canopy diameter (average of East-West and North-South dimensions) during active growth period
   Quantitative

6. Tree shape
   To be recorded during active growth period
   3. Upright
   5. Spreading
   7. Drooping

7. Leaf size
   To be recorded on mature leaf
   3. Small
   5. Medium
   7. Large
8. **Leaf petiole length**
   To be recorded as average of 5 random mature leaves
   Quantitative

9. **Leaf shape**
   To be recorded on mature leaf
   
   1  Narrow elliptic
   2  Elliptic
   3  Broad elliptic
   99 Others (Specify in the 'Remarks' descriptor)

10. **Inflorescence size**
    To be recorded during peak flowering
    
    3  Small
    5  Intermediate
    7  Large

11. **Number of flower buds per inflorescence**
    To be recorded as average of 10 random inflorescences
    Quantitative

12. **Inflorescence position**
    To be recorded during peak flowering
    
    1  Terminal
    2  Axillary
    99 Others (Specify in the 'Remarks' descriptor)

13. **Date of start of flowering (dd/mm/yyyy)**
    To be recorded when 5% flower buds have opened
    Date
14. **Date of end of flowering (dd/mm/yyyy)**
   To be recorded when 85-90% flower buds have opened
   
   Date

15. **Dichogamy**
   1. Protandrous
   2. Protogynous

16. **Date of fruit maturity (dd/mm/yyyy)**
   To be recorded at "Packing Tissue Turns Brown" (PTB) stage
   
   Date

17. **Nut shape**
   To be recorded on mature nut
   
   1. Round
   2. Ovate
   3. Oblong
   4. Cordate
   5. Elliptic
   99. Others (Specify in the 'Remarks' descriptor)

18. **Nut length (cm)**
   To be recorded as average of 20 random nuts
   
   Quantitative

19. **Nut width (cm)**
   To be recorded as average of same 20 nuts
   
   Quantitative

20. **Nut weight (g)**
   To be recorded as average of same 20 nuts
   
   Quantitative
21. **Shell weight (g)**
   To be recorded as average of shells of same 20 nuts

   Quantitative

22. **Shell thickness (mm)**
   To be recorded as average of same 20 shells after removing the peels

   Quantitative

23. **Shell softness**
   To be recorded on mature nut

   1. Paper shelled (very soft)
   3. Soft
   5. Intermediate
   7. Hard
   9. Very hard

24. **Shell surface**
   To be recorded on mature nut

   3. Smooth
   5. Lightly corrugated
   7. Highly corrugated

25. **Shell colour intensity**
   To be recorded on mature nut

   1. Very light
   3. Light
   5. Medium
   7. Dark
   9. Very dark

26. **Kernel weight (g)**
   To be recorded as average of kernels of same 20 nuts

   Quantitative

27. **Kernel colour**
   To be recorded on mature nut

   1. Extremely light
   2. Light
   3. Amber
   4. Dark amber

28. **Kernel flavour**
   To be recorded on mature nut

   1. Satisfactory
   2. Unsatisfactory
29. **Productivity status**
   To be recorded at the time of harvest
   
<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
</tbody>
</table>

30. **Biotic Stress Susceptibility**
   Specify the infestation or infection using 1 - 9 scale.
   
   Note: For additional information as common name(s) of disease(s)/pest(s) and causal organism(s) may be appended in the Biotic notes descriptor.
   
<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very low or no visible sign of susceptibility</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
</tr>
<tr>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>Very high</td>
</tr>
</tbody>
</table>

31. **Biotic notes**
   Text

32. **Remarks**
   Text