Descriptors for

Tea

(*Camellia sinensis*)

International Plant Genetic Resources Institute

IPGRI

List of descriptors

Almond (revised) * (E) 1985
Apple (E) 1982
Apricot * (E) 1984
Avocado (E,S) 1995
Bambara groundnut (E) 1987
Banana (revised) * (E,F,S) # 1996
Barley (E) 1994
Beta (E) 1991
Black pepper (E,S) 1995
Brassica and *Raphanus* (E) 1990
Brassica campestris L. (E) 1987
Buckwheat (E) 1994
Capsicum (E,S) 1995
Cardamom (E) 1994
Cashew (E) 1986
Cherry * (E) 1985
Chickpea (E) 1993
Citrus (E) 1988
Coconut (E) 1992
Coffee (E,F,S) # 1996
Colocasia * (E) 1980
Cotton (Revised) (E) 1985
Cowpea (E) 1983
Cultivated potato * (E) 1977
Echinochloa millet * (E) 1983
Eggplant (E,F) 1990
Faba bean * (E) 1985
Finger millet (E) 1985
Forage grass * (E) 1985
Forage legumes * (E) 1984
Grape * (E) 1983
Groundnut (E,F,S) 1992
Kodo millet * (E) 1983
Lentil * (E) 1985
Lima bean * (E) 1982
Lupin / Lupinos * (E,S) 1981
Maize (E,F,S) 1991
Mango (E) 1989
Medicago (Annual) * (E,F) 1991
Mung bean * (E) 1980
Oat * (E) 1985
Oca * (S) 1982
Oil palm (E) 1989
Panicum miliaceum and *P. sumatrense* (E) 1985
Papaya (E) 1988
Peach * (E) 1985
Pear * (E) 1983
Pearl millet (E,F) 1993
Phaseolus acutifolius (E) 1985
Phaseolus coccineus * (E) 1983
Phaseolus vulgaris * (E) 1982
Pigeonpea (E) 1993
Pineapple (E) 1991
Pistachio (E,F)# 1997
Plum * (E) 1985
Potato variety * (E) 1985
Quinoa * (E) 1981
Rice * (E) 1980
Rye and Triticale * (E) 1985
Safflower * (E) 1983
Sesame * (E) 1981
Setaria italica and *S. pumilia* (E) 1985
Sorghum (E,F) 1993
Soyabean * (E,C) 1984
Strawberry (E) 1986
Sunflower * (E) 1985
Sweet potato (E,F,S) 1991
Tomato (E,F,S) # 1996
Tropical fruit * (E) 1980
Vigna aconitifolia and *V. trilobata* (E) 1985
Vigna mungo and *V. radiata* (Revised) * (E) 1985
Walnut (E) 1994
Wheat (Revised) * (E) 1985
Wheat and *Aegilops* * (E) 1978
White Clover (E) 1992
Winged bean * (E) 1979
Xanthosoma (E) 1989
Yams * (E) 1980

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Descriptors for

Tea

(*Camellia sinensis*)

International Plant Genetic Resources Institute

IPGRI

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CONTENTS

PREFACE

Descriptors for Tea (*Camellia sinensis*) was prepared by Dr Samresh Dwivedi while working as Plant Breeder (Tea) at CSIR Complex, Palampur (currently known as the Institute of Himalayan Bioresources Technology, Palampur). To prepare this list, over 250 accessions were studied comprising all three subspecies (*sinensis*, *assamica* and *cambodiensis*). Dr Dwivedi is currently working at the Central Institute of Medicinal and Aromatic Plants (Lucknow, India). A draft version prepared in the internationally accepted IPGRI format for descriptor lists was subsequently sent to a number of experts for their comments and amendments. A full list of the names and addresses of those involved is given in 'Contributors'.

IPGRI encourages the collection of data for descriptors on the first four categories of this list – *Passport*, *Management*, *Environment and Site*, *Characterization* – and endorses data in these categories as those that should be available for any accession. However, the number of each of the site and environment descriptor types used will depend on the crop and their importance to the crop's description. Descriptors listed under *Evaluation* allow for a more detailed description of the accession's characters, but generally require replicated site and time trials.

Although the suggested coding should not be regarded as the definitive scheme, this format represents an important tool for a standardized characterization system and it is promoted by IPGRI throughout the world.

This descriptor list is intended to be comprehensive for the descriptors that it contains. This approach assists with the standardization of descriptor definitions. IPGRI does not, however, assume that each curator will characterize accessions of their collection utilizing all descriptors given. Descriptors should be used when they are useful to the curator for the management and maintenance of the collection and/or to the users of the plant genetic resources. Minimum, highly discriminating descriptors are marked with stars (★)

This descriptor list provides an international format and thereby produces a universally understood 'language' for plant genetic resources data. The adoption of this scheme for data encoding, or at least the production of a transformation method to convert other schemes into the IPGRI format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication, and will assist with the utilization of germplasm. It is recommended, therefore, that information should be produced by closely following the descriptor list with regard to: ordering and numbering descriptors, using the descriptors specified, and using the descriptor states recommended.

Annex I contains multicrop passport descriptors developed jointly by IPGRI and FAO, to provide consistent coding schemes for common passport descriptors across crops and aim to be compatible with both future IPGRI crop descriptors lists and the FAO World Information and Early Warning System (WIEWS) on plant genetic resources.

Any suggestions for improvement on the Descriptor List for Tea will be highly appreciated by IPGRI.

DEFINITIONS AND USE OF THE DESCRIPTORS

IPGRI now uses the following definitions in genetic resources documentation:

Passport descriptors: These provide the basic information used for the general management of the accession (including the registration at the genebank and other identification information) and describe parameters that should be observed when the accession is originally collected.

Management descriptors: These provide the basis for the management of accessions in the genebank and assist with their multiplication and regeneration.

Environment and site descriptors: These describe the environmental and site-specific parameters that are important when characterization and evaluation trials are held. They can be important for the interpretation of the results of those trials. Site descriptors for germplasm collecting are also included here.

Characterization descriptors: These enable an easy and quick discrimination between phenotypes. They are generally highly heritable, can be easily seen by the eye and are equally expressed in all environments. In addition, these may include a limited number of additional traits thought desirable by a consensus of users of the particular crop.

Evaluation descriptors: Many of the descriptors in this category are susceptible to environmental differences but are generally useful in crop improvement and others may involve complex biochemical or molecular characterization. They include yield, agronomic performance, stress susceptibilities and biochemical and cytological traits.

Characterization will normally be the responsibility of genebank curators, while evaluation will typically be carried out elsewhere (possibly by a multidisciplinary team of scientists). The evaluation data should be fed back to the genebank which will maintain a data file.

Minimum highly discriminating descriptors are marked with stars (★).

The following internationally accepted norms for the scoring, coding and recording of descriptor states should be followed:

(a) the Système International d'Unités (SI units) is used;

(b) the units to be applied are given in square brackets following the descriptor name;

(c) standard colour charts, e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of Colour, Munsell Soil Color Chart or Munsell Color Charts for Plant Tissues, are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the section where it is used);

(d) many quantitative characters which are continuously variable are recorded on a 1-9 scale, where:

1	Very low	6	Intermediate to high
2	Very low to low	7	High
3	Low	8	High to very high
4	Low to intermediate	9	Very high
5	Intermediate		

is the expression of a character. The authors of this list have sometimes described only a selection of the states, e.g. 3, 5 and 7 for such descriptors. Where this has occurred, the full range of codes is available for use by extension of the codes given or by interpolation between them, e.g. in Section 9 (Biotic stress susceptibility) 1 = very low susceptibility and 9 = very high susceptibility;

(e) when a descriptor is scored using a 1-9 scale, such as in (d), '0' would be scored when (i) the character is not expressed; (ii) when a descriptor is not applicable. In the following example, '0' will be recorded if an accession does not have a central leaf lobe:

Shape of central leaf lobe

3	Toothed
5	Elliptic
7	Linear

(f) absence / presence of characters is scored as in the following example:

Absence/presence of terminal leaflet

0	Absent
1 (or +)	Present

(g) blanks are used for information not yet available;

(h) for accessions which are not generally uniform for a descriptor (e.g. mixed collection, genetic segregation), the mean and standard deviation could be reported where the descriptor is continuous. Where the descriptor is discontinuous, several codes in the order of frequency could be recorded; or other publicized methods can be utilized, such as R.S. Rana *et al*. (1991) or van Hintum (1993), that clearly state a method for scoring heterogeneous accessions;

(i) dates should be expressed numerically in the format YYYYMMDD, where

YYYY	-	4 digits to represent the year
MM	-	2 digits to represent the month
DD	-	2 digits to represent the day.

PASSPORT

1. Accession descriptors

★ 1.1 Accession number

This number serves as a unique identifier for accessions and is assigned when an accession is entered into the collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number should never be re-used. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN indicates an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system).

1.2 Donor name

Name of institution or individual responsible for donating the germplasm

1.3 Donor number

Number assigned to an accession by the donor

1.4 Other number(s) associated with the accession

Any other identification number known to exist in other collections for this accession, e.g. USDA Plant Inventory number (not Collecting number, see descriptor **2.3**). Other numbers can be added as 1.4.3, etc.

1.4.1 Other number 1

1.4.2 Other number 2

1.5. Scientific name

★ 1.5.1 Genus

★ 1.5.2 Species

★ 1.5.3 Subspecies

1.5.4 Botanical variety

1.6 Pedigree
Parentage or nomenclature, and designations assigned to breeders' material

1.6.1 Male parent

1.6.2 Female parent

1.6.3 Other (specify in descriptor **1.11 Notes)**

1.7 Accession

1.7.1 Accession name
Either a registered or other formal designation given to the accession (e.g. 'Nanda Devi' for Biclonal Tocklai seedstock No. TS.378)

1.7.2 Local language
Language in which the accession name is given

1.7.3 Translation/Transliteration
Provide translation of the local accession name into English

1.7.4 Synonyms
Include here any previous identification other than the current name. Collecting number or newly assigned station name are frequently used as identifiers.

1.8 Acquisition date [YYYYMMDD]
Date on which the accession entered the collection

1.9 Accession size
Approximate number or weight of seeds, budwoods or plants of an accession in the genebank

1.10 Type of material received

1	Zygotic embryo	5	Pollen
2	Seed	6	Root / tuber
3	Plant (including seedling)	99	Other (specify in descriptor **1.11 Notes**)
4	Shoot / bud / stem cutting		

1.10.1 Seed classes
1 Male and female parents are known
2 Only female parents are known
3 Both parents unknown

1.11 Notes
Any additional information may be specified here

2. Collecting descriptors

2.1 Collecting institute(s)

Name and address of the institute(s) and individuals collecting / sponsoring the collection of the sample(s)

2.2 Site number

Number assigned to the physical site by the collector

2.3 Collecting number

Original number assigned by the collector(s) of the sample, normally composed of the name or initials of the collector(s) followed by a number. This item is essential for identifying duplicates held in different collections. It should be unique and always accompany subsamples wherever they are sent.

2.4 Collecting date of original sample [YYYYMMDD]

★ 2.5 Country of collecting

Name of the country in which the sample was collected. Use the three-letter abbreviations from the *International Standard (ISO) Codes for the representation of names of countries*, No. 3166, 4th Edition. Copies of these are available from DIN: Deutsche Institut für Normung e.V., D-10772 Berlin, Germany; Tel. 30-2601-2860; Fax 30-2601-1231, Tlx. 184 273-din-d.

2.6 Province/State

Name of the primary administrative subdivision of the country in which the sample was collected

2.7 Department/County

Name of the secondary administrative subdivision (within a Province / State) of the country in which the sample was collected

★ 2.8 Location of collecting site

Distance in kilometers and direction from the nearest town, village or map grid reference point (e.g. CURITIBA 7S means 7 km south of Curitiba)

2.9 Latitude of collecting site

Degrees and minutes followed by N (North) or S (South) (e.g. 1030S). Missing data (minutes) should be indicated with hyphen (e.g. 10—S).

2.10 Longitude of collecting site

Degrees and minutes followed by E (East) or W (West) (e.g. 07625W). Missing data (minutes) should be indicated with hyphen (e.g. 076—W).

2.11 Elevation of collecting site [m asl]

★ 2.12 Collecting source

0 Unknown
1 Wild habitat
- 1.1 Forest / woodland
- 1.2 Shrubland
- 1.3 Grasslands
- 1.4 Desert / tundra

2 Farm
- 2.1 Field
- 2.2 Orchard
- 2.3 Garden
- 2.4 Fallow
- 2.5 Pasture
- 2.6 Store

3 Market
- 3.1 Town
- 3.2 Village
- 3.3 Urban area (around city)
- 3.4 Other exchange system

4 Institute / Research organization
99 Other (specify in descriptor **2.28 Collector's notes**)

2.13 Collecting source environment

Use descriptors **5.1.1** to **5.1.23** in section 5

2.14 Status of sample

0 Unknown
1 Wild
2 Weedy
3 Traditional cultivar / Landrace
4 Breeder's line
5 Advanced cultivar
99 Other (specify in descriptor **2.28 Collector's notes**)

2.15 Type of sample

Type of plant material collected. If different types of material were collected from the same source, each sample (type) should be designated with a unique collecting number and a corresponding unique accession number

1 Zygotic embryo
2 Seed
3 Vegetative
4 Pollen
5 Composite (grafted tea bush)
6 Tissue culture (specify which part of the plant is used in **2.28 Collector's notes**)

2.16 Pruned status of the plant

0 No (Unpruned)
1 Yes (Pruned)

2.17 Number of plants sampled

Approximate number of plants collected in the field to produce this accession

2.18 Number of clonal material (stem cuttings) collected

2.19 Cropping system

1 Monoculture
2 Mixed with crops
99 Other (specify in descriptor **2.28 Collector's notes**)

2.20 Associated flora

Other dominant crop / plant species, found in and around the collecting site

2.21 Cultural practices

2.21.1 Planting date [YYYYMMDD]

2.21.2 First pruning date [YYYYMMDD]

2.21.3 Type of prune/skiff

1 Light skiff
2 Medium skiff
3 Deep skiff
4 Level skiff and unpruned
5 Exceptional cases: collar prune
99 Other (specify in descriptor **2.28 Collector's notes**)

2.21.4 First pruning height [cm]

2.21.5 First harvest date [YYYYMMDD]

2.21.6 Irrigation

Specify amount, frequency and method of application

2.22 Local/vernacular name

Name given by farmer to crop and cultivar / landrace / clone / wild form. State language and dialect if the ethnic group is not provided

2.23 Ethnic group

Name of the ethnic group of the donor of the sample or of the people living in the area of collecting

2.24 Uses of the accession

1 Green tea
2 Black tea
3 Oolong tea
4 Instant tea
5 Tea-seed oil
6 Medicinal
7 Beverage
8 Ornamental
9 Pesticide (saponine)
99 Other (specify in descriptor **2.28 Collector's notes**)

2.25 Photograph

Was a photograph(s) taken of the accession or habitat at the time of collecting? If so, provide an identification number(s) in descriptor **2.28 Collector's notes.**

0 No
1 Yes

2.26 Herbarium specimen

Was a herbarium specimen collected? If so, provide an identification number and indicate in which place (herbarium) the tea specimen was deposited, in descriptor **2.28 Collector's notes.**

0 No
1 Yes

2.27 Prevailing stresses

Information on associated biotic and abiotic stresses and the accession's reaction. Specify stresses in descriptor **2.28 Collector's notes**.

2.28 Collector's notes

Additional information recorded by the collector or any specific information on any state in any of the above descriptors

MANAGEMENT

3. Plant management descriptors

3.1 Accession number (Passport 1.1)

3.2 Field conservation

3.2.1 Field location

3.2.2 Planting date [YYYYMMDD]

3.2.3 Field duplicates
For each duplicate indicate field location and planting date

3.2.3.1 Field location

3.2.3.2 Planting date [YYYYMMDD]

3.3 *In vitro* conservation

3.3.1 Type of explant
1 Apical or axillary meristem
2 Nodal cutting
3 Zygotic embryo
4 Seed
99 Other (specify in descriptor **3.5 Notes**)

3.3.2 Introduction date [YYYYMMDD]

3.3.3 Type of subcultured material
1 Axillary shoot
2 Callus
3 Cell suspension
99 Other (specify in descriptor **3.5 Notes**)

3.3.4 Regeneration process
1 Organogenesis
2 Somatic embryogenesis
99 Other (specify in descriptor **3.5 Notes**)

3.3.5 Number of plants at the establishment
(Number of replicates)

3.3.6 Last subculture date [YYYYMMDD]

3.3.7 Medium used at the last subculture

3.3.8 Number of plants at the last subculture

3.3.9 Location after the last subculture

3.4 Cryopreservation

3.4.1 Type of material for cryopreservation

1 Seed
2 Zygotic embryo
3 Apex
4 Somatic embryo
5 Callus
6 Cell suspension
7 Pollen
99 Other (specify in descriptor **3.5 Notes**)

3.4.2 Introduction date in liquid nitrogen storage [YYYYMMDD]

3.4.3 Number of samples introduced in liquid nitrogen storage

3.4.4 End of storage period [YYYYMMDD]

3.4.5 Number of samples taken from liquid nitrogen storage

3.4.6 Type of subcultured material for recovery

(After liquid nitrogen)

1 Seed
2 Zygotic embryo
3 Apex
4 Somatic embryo
5 Callus
6 Cell suspension
99 Other (specify in descriptor **3.5 Notes**)

3.4.7 Regeneration process

1 Organogenesis
2 Somatic embryogenesis
99 Other (specify in descriptor **3.5 Notes**)

3.4.8 Sequence of culture media for multiplication

3.4.8.1 Number of subcultures

3.4.8.2 Number of replicates

3.4.8.3 Procedures for establishment of plantlets *in vivo*
(For example, temperature, humidity, type of substrate, phytosanitary treatments, fertilizers, etc. Specify in descriptor **3.5 Notes**)

3.4.8.4 Number of plants at the establishment

3.4.9 Number of recovery samples

3.4.10 Location after the last subculture

3.5 Notes

Any additional information may be specified here

ENVIRONMENT AND SITE

4. Characterization and/or evaluation site descriptors

4.1 Country of characterization and/or evaluation

(See instructions in descriptor **2.5 Country of collecting**)

4.2 Site (research institute)

4.2.1 Latitude

Degrees and minutes followed by N (North) or S (South) (e.g. 1030S). Missing data (minutes) should be indicated with hyphen (e.g. 10—S).

4.2.2 Longitude

Degrees and minutes followed by E (East) or W (West) (e.g. 07625W). Missing data (minutes) should be indicated with hyphen (e.g. 076—W).

4.2.3 Elevation [m asl]

4.2.4 Name and address of farm or institute

4.3 Evaluator's name and address

4.4 Sowing date [YYYYMMDD]

4.5 Planting date [YYYYMMDD]

4.6 Modality of sowing

1	Greenhouse	4	Field
2	Open air	99	Other (specify in descriptor **4.15 Notes**)
3	Heated bed		

4.7 Transplanting date [YYYYMMDD]

4.8 Evaluation environment

Environment in which characterization / evaluation was carried out

1	Field	4	Laboratory
2	Screenhouse	99	Other (specify in descriptor **4.15 Notes**)
3	Glasshouse		

4.9 Field establishment [%]

Percentage of plants established. Specify number of days from planting / sowing, after which establishment is measured

4.10 Sowing/transplanting site in the field

Give block, strip and / or row / plot numbers as applicable, plants / plot, replication

4.11 Field spacing

4.11.1 Distance between plants in a row [m]

4.11.2 Distance between rows [m]

1 Single hedge
2 Double / triple hedge

4.12 Environmental characteristics of site

Use descriptors **5.1.1** to **5.1.23** in section 5

4.13 Fertilizer

Specify types, doses, frequency of each and method of application

4.14 Plant protection

Specify pesticides used, doses, frequency of each and method of application

4.15 Notes

Any other site-specific information

5. Collecting and/or characterization/evaluation site environment descriptors

5.1 Site environment

★ **5.1.1 Topography**

This refers to the profile in elevation of the land surface on a broad scale. The reference is FAO (1990)

1	Flat	0 - 0.5%
2	Almost flat	0.6 - 2.9%
3	Gently undulating	3 - 5.9%
4	Undulating	6 - 10.9%
5	Rolling	11 - 15.9%
6	Hilly	16 - 30%
7	Steeply dissected	>30%, moderate elevation range
8	Mountainous	>30%, great elevation range (>300 m)
99	Other	(specify in appropriate section's Notes)

★ **5.1.2 Higher level landform (general physiographic features)**

The landform refers to the shape of the land surface in the area in which the site is located (adapted from FAO 1990)

1	Plain	5	Upland
2	Basin	6	Hill
3	Valley	7	Mountain
4	Plateau		

5.1.3 Land element and position

Description of the geomorphology of the immediate surroundings of the site (adapted from FAO 1990). (See Fig. 1)

1	Plain level	16	Longitudinal dune
2	Escarpment	17	Interdunal depression
3	Interfluve	18	Mangrove
4	Valley	19	Upper slope
5	Valley floor	20	Midslope
6	Channel	21	Lower slope
7	Levee	22	Ridge
8	Terrace	23	Beach
9	Floodplain	24	Beachridge
10	Lagoon	25	Rounded summit
11	Pan	26	Summit
12	Caldera	27	Coral atoll
13	Open depression	28	Drainage line (bottom position in flat or almost-flat terrain)
14	Closed depression	29	Coral reef
15	Dune	99	Other (specify in appropriate section's Notes)

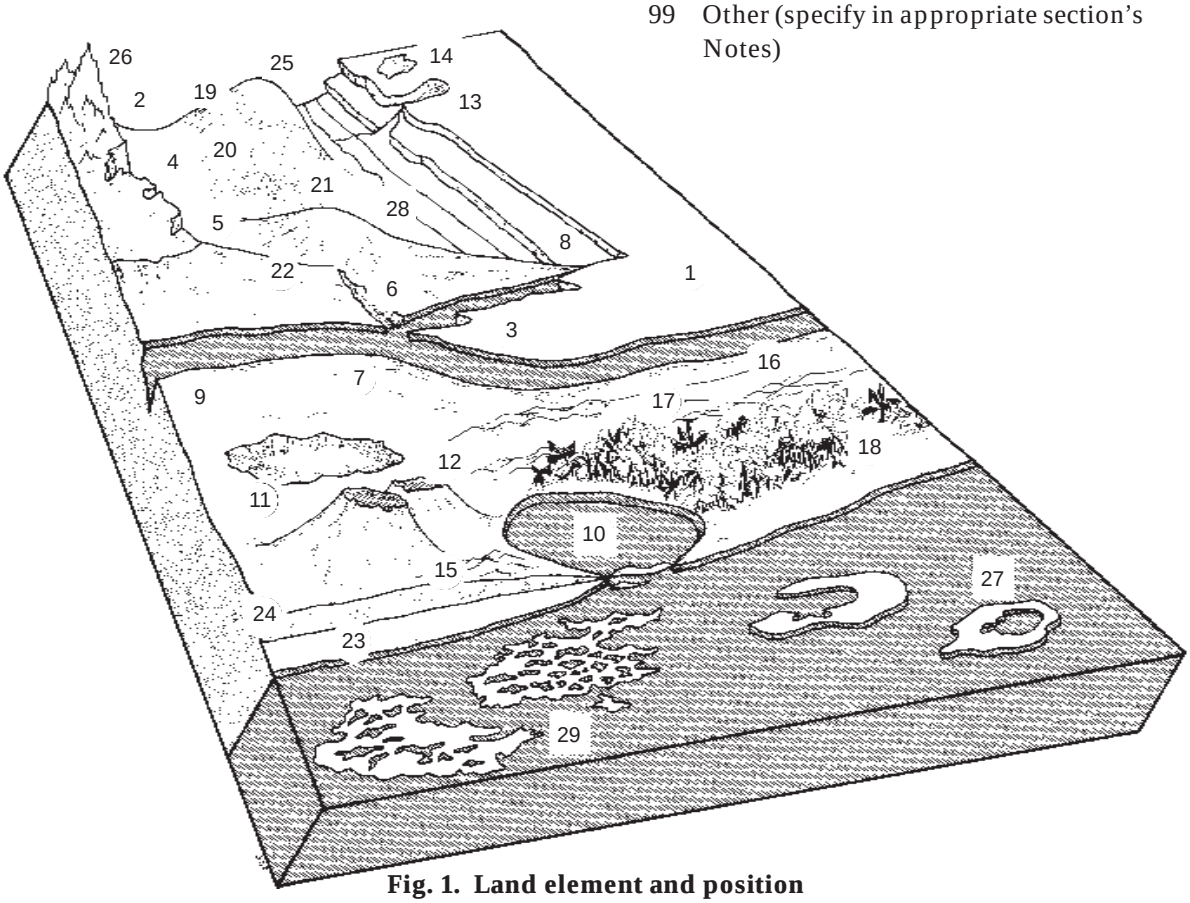

Fig. 1. Land element and position

★ **5.1.4 Slope** [°]
Estimated slope of the site

★ **5.1.5 Slope aspect**
The direction that the slope on which the accession was collected faces. Describe the direction with symbols N, S, E, W (e.g. a slope that faces a southwestern direction has an aspect of SW)

5.1.6 Crop agriculture
(From FAO 1990)

1 Annual field cropping
2 Perennial field cropping

5.1.7 Overall vegetation surrounding and at the site
(Adapted from FAO 1990)

1	Grassland	(Grasses, subordinate forbs, no woody species)
2	Forbland	(Herbaceous plants predominant)
3	Forest	(Continuous tree layer, crowns overlapping, large number of tree and shrub species in distinct layers)
4	Woodland	(Continuous tree layer, crowns usually not touching, understorey may be present)
5	Shrubland	(Continuous layer of shrubs, crowns touching)
6	Savanna	(Grasses with a discontinuous layer of trees or shrubs)
99	Other	(specify in appropriate section's Notes)

5.1.8 Soil parent material
(Adapted from FAO 1990)
Two lists of examples of parent material and rock are given below. The reliability of the geological information and the knowledge of the local lithology will determine whether a general or a specific definition of the parent material can be given. Saprolite is used if the *in situ* weathered material is thoroughly decomposed, clay-rich but still showing rock structure. Alluvial deposits and colluvium derived from a single rock type may be further specified by that rock type.

5.1.8.1 Unconsolidated material

1 Aeolian deposits (unspecified)
2 Aeolian sand
3 Littoral deposits
4 Lagoonal deposits
5 Marine deposits
6 Lacustrine deposits
7 Fluvial deposits
8 Alluvial deposits
9 Unconsolidated (unspecified)
10 Volcanic ash
11 Loess
12 Pyroclastic deposits
13 Glacial deposits
14 Organic deposits
15 Colluvial deposits
16 *In situ* weathered
17 Saprolite
99 Other (specify in appropriate section's Notes)

5.1.8.2 Rock type

(Adapted from FAO 1990)

1 Acid igneous / metamorphic rock
2 Granite
3 Gneiss
4 Granite / gneiss
5 Quartzite
6 Schist
7 Andesite
8 Diorite
9 Basic igneous / metamorphic rock
10 Ultra basic rock
11 Gabbro
12 Basalt
13 Dolerite
14 Volcanic rock
15 Sedimentary rock
16 Limestone
17 Dolomite
18 Sandstone
19 Quartzitic sandstone
20 Shale
21 Marl
22 Travertine
23 Conglomerate
24 Siltstone
25 Tuff
26 Pyroclastic rock
27 Evaporite
28 Gypsum rock
99 Other (specify in appropriate section's Notes)
0 Not known

5.1.9 Stoniness/rockiness/hardpan/cementation

1 Tillage unaffected
2 Tillage affected
3 Tillage difficult
4 Tillage impossible
5 Essentially paved

★ 5.1.10 Soil drainage

(Adapted from FAO 1990)

3 Poorly drained
5 Moderately drained
7 Well drained

★ 5.1.11 Soil salinity

1 <160 ppm dissolved salts
2 160 - 240 ppm
3 241 - 480 ppm
4 >480 ppm

5.1.12 Soil depth to groundwater table

(Adapted from FAO 1990)

The depth to the groundwater table, if present, as well as an estimate of the approximate annual fluctuation, should be given. The maximum rise of the groundwater table can be inferred approximately from changes in profile colour in many, but not all, soils.

1 0 - 25 cm
2 25.1 - 50 cm
3 50.1 - 100 cm
4 100.1 - 150 cm
5 >150 cm

5.1.13 Soil matrix colour

(Adapted from FAO 1990)

The colour of the soil matrix material in the root zone around the accession is recorded in the moist condition (or both dry and moist condition, if possible) using the notation for hue, value and chroma as given in the Munsell Soil Color Charts (Munsell 1975). If there is no dominant soil matrix colour, the horizon is described as mottled and two or more colours are given and should be registered under uniform conditions. Early morning and late evening readings are not accurate. Provide depth of measurement (cm). If colour chart is not available, the following states may be used:

1	White	7	Reddish brown	13	Greyish
2	Red	8	Yellowish brown	14	Blue
3	Reddish	9	Yellow	15	Bluish-black
4	Yellowish red	10	Reddish yellow	16	Black
5	Brown	11	Greenish, green		
6	Brownish	12	Grey		

★ **5.1.14 Soil pH**

Actual value of the soil within the following root depths around the accession

5.1.14.1 pH at 10-15 cm
5.1.14.2 pH at 16-30 cm
5.1.14.3 pH at 31-60 cm
5.1.14.4 pH at 61-90 cm

★ **5.1.15 Soil erosion**

3 Low
5 Intermediate
7 High

5.1.16 Rock fragments

(Adapted from FAO 1990)

Large rock and mineral fragments (>2 mm) are described according to abundance

1	0 - 2%	4	15.1 - 40%
2	2.1 - 5%	5	40.1 - 80%
3	5.1 - 15%	6	>80%

★ **5.1.17 Soil texture classes**

(Adapted from FAO 1990)

For convenience in determining the texture classes of the following list, particle size classes are given for each of the fine earth fractions below. (See Fig. 2)

1	Clay	12	Coarse sandy loam
2	Loam	13	Loamy sand
3	Clay loam	14	Loamy very fine sand
4	Silt	15	Loamy fine sand
5	Silty clay	16	Loamy coarse sand
6	Silty clay loam	17	Very fine sand
7	Silt loam	18	Fine sand
8	Sandy clay	19	Medium sand
9	Sandy clay loam	20	Coarse sand
10	Sandy loam	21	Sand, unsorted
11	Fine sandy loam	22	Sand, unspecified

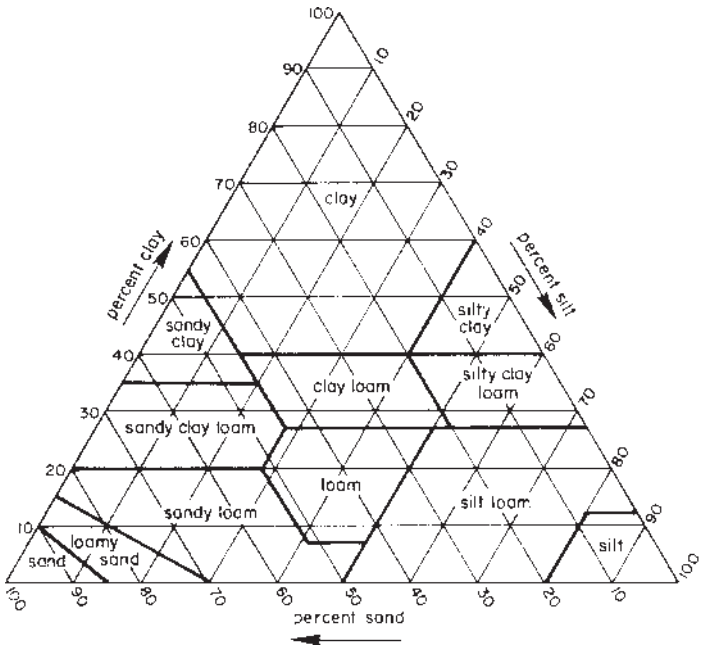

Fig. 2. Soil texture classes

5.1.17.1 Soil particle size classes

(Adapted from FAO 1990)

1	Clay	< 2 µm
2	Fine silt	2 - 20 µm
3	Coarse silt	21 - 63 µmm
4	Very fine sand	64 - 125 µm
5	Fine sand	126 - 200 µm
6	Medium sand	201 - 630 µm
7	Coarse sand	631 - 1250 µm
8	Very coarse sand	1251 - 2000 µm

5.1.18 Soil organic matter content

1 Nil (as on arid zones)
2 Low (as in long-term cultivation in a tropical setting)
3 Medium (as in recently cultivated but not yet much depleted)
4 High (as in never cultivated, and in recently cleared from forest)
5 Peaty

★ ### 5.1.19 Soil taxonomic classification

As detailed a classification as possible should be given. This may be taken from a soil survey map. State class (e.g. Alfisols, Spodosols, Vertisols, etc.).

5.1.20 Water availability

1 Rain-fed
2 Irrigated
3 Flooded
4 River banks
5 Sea coast
99 Other (specify in appropriate section's Notes)

5.1.21 Soil fertility

General assessment of the soil fertility based on existing vegetation

3 Low
5 Moderate
7 High

5.1.22 Climate of the site

Should be assessed as close to the site as possible

★ #### 5.1.22.1 Temperature [°C]

Provide either the monthly (mean, maximum, minimum) or the seasonal (mean, maximum, minimum)

5.1.22.2 Dry season length [d]

★ **5.1.22.3 Rainfall** [mm]
Annual average (state number of recorded years)

5.1.22.4 Wind [km/s]
Annual average (state number of years recorded)

5.1.22.4.1 Frequency of typhoons or hurricane force winds
3 Low
5 Intermediate
7 High

5.1.22.4.2 Date of most recent typhoons or hurricane force winds [YYYYMMDD]

5.1.22.4.3 Annual maximum wind velocity [km/s]

5.1.22.5 Frost

5.1.22.5.1 Date of most recent frost [YYYYMMDD]

5.1.22.5.2 Minimum temperature [°C]
Specify seasonal average and minimum survival temperature

5.1.22.5.3 Duration of temperature below 0°C [d]

5.1.22.6 Relative humidity

5.1.22.6.1 Relative humidity diurnal range [%]

5.1.22.6.2 Relative humidity seasonal range [%]

5.1.22.7 Light
3 Shady
7 Sunny

5.1.22.8 Daylength [h]
Provide either the monthly (mean, maximum, minimum) or the seasonal (mean, maximum, minimum)

5.1.23 Other
Specify in appropriate section's Notes

CHARACTERIZATION

6. Plant descriptors

6.1 Vegetative

For all colour descriptors, RHS colour codes are given in parentheses beside descriptor states. Unless otherwise specified, descriptors should be recorded in the first year of production of leaves

6.1.1 Tree habit

1 Arbour
2 Semi-arbour
3 Shrub

6.1.1.1 Growth habit

1 Horizontal-spreading
2 Erect-upright

6.1.2 Plant height [cm]

Measured from ground level to apical meristem, on unpruned and unplucked five-year-old plants after planting

6.1.3 Stem type

1 Single stem
2 Multiple stems

6.1.4 Stem colour

Recorded on three-year-old-plants, at 3-5 cm above ground, exposed to full sunlight

1 Greenish or light grey (greyed-green group 198 A)
2 Greyish brown (grey group 201 C)
3 Greyed purple (greyed-purple group 184 C, 185 A)
4 Red-purple (red-purple group 59 B)
99 Other (specify in descriptor **6.5 Notes**)

6.1.5 Stem pigmentation

1 Mostly basal
2 Mostly lower
3 Mostly medium
4 Mostly upper
5 Indiscriminate

6.1.6 Branch angle

3 Acute
7 Obtuse

6.1.7 Number of nodes to first flower

Recorded on shoots on lateral branches or terminal buds

★ **6.1.8 Internode length** [cm]

Distance between the 5th and 6th leaves from top of a flush growth. Average of 10 shoots exposed to full sunlight

6.1.9 Pigmentation in young leaves and petiole

Scored in the main season and in the off season period

0 Absent
1(or +) Present

6.1.10 Immature leaf colour

(Leaves that have recently unfurled)

1 Yellow
2 Dark green
99 Other (specify in descriptor **6.5 Notes**)

★ **6.1.11 Mature leaf colour**

1 Light green (green group 138 A)
2 Green (green group 138 B)
3 Greyed-green (greyed-green group 191 A)
4 Greyed-yellow (greyed-yellow group 160 A)
5 Yellow-green (yellow-green group 147 B)
99 Other (specify in descriptor **6.5 Notes**)

6.1.12 Leaf shape

Observed on the 5th leaf below the terminal bud of a flush growth exposed to full sunlight. (See Fig. 3)

1 Ovate
2 Oblong
3 Elliptic
4 Lanceolate
99 Other (specify in descriptor **6.5 Notes**)

6.1.13 Leaf upper surface

1 Smooth
2 Rugose
99 Other (specify in descriptor **6.5 Notes**)

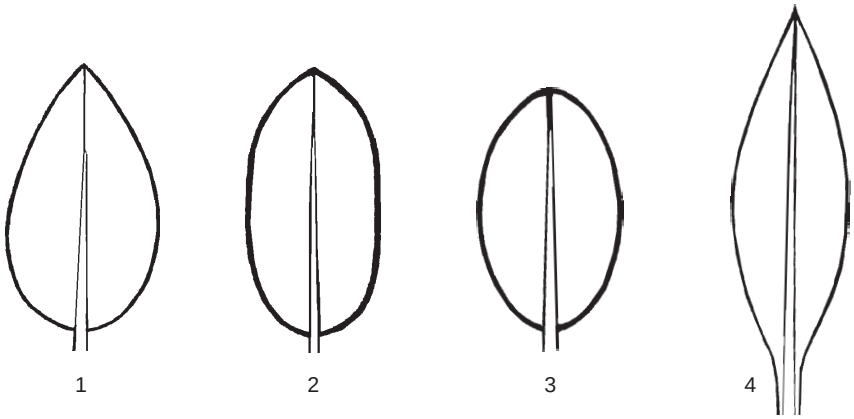

Fig. 3. Leaf shape

6.1.14 Leaf apex shape

Recorded on the 5th leaf of a flush growth exposed to full sunlight

1 Acute
2 Blunt (Obtuse)
3 Attenuate
99 Other (specify in descriptor **6.5 Notes**)

6.1.15 Leaf apex habit

Observed on the 5th leaf of a flush growth exposed to full sunlight

1 Down turned (recurved)
2 Straight

6.1.16 Leaf base shape

Observed on the 5th leaf below the terminal bud of a flush growth in plants exposed to full sunlight. (See Fig. 4)

1 Attenuate (acute)
2 Rounded
3 Blunt (obtuse)
99 Other (specify in descriptor **6.5 Notes**)

★ **6.1.17 Leaf margin**

(See Fig. 5)

1 Entire
2 Wavy
3 Serrulate
4 Biserrate
5 Denticulate
99 Other (specify in descriptor **6.5 Notes**)

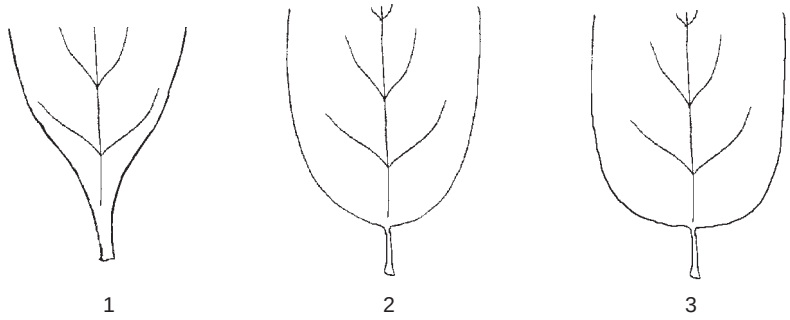

Fig. 4. Leaf base shape

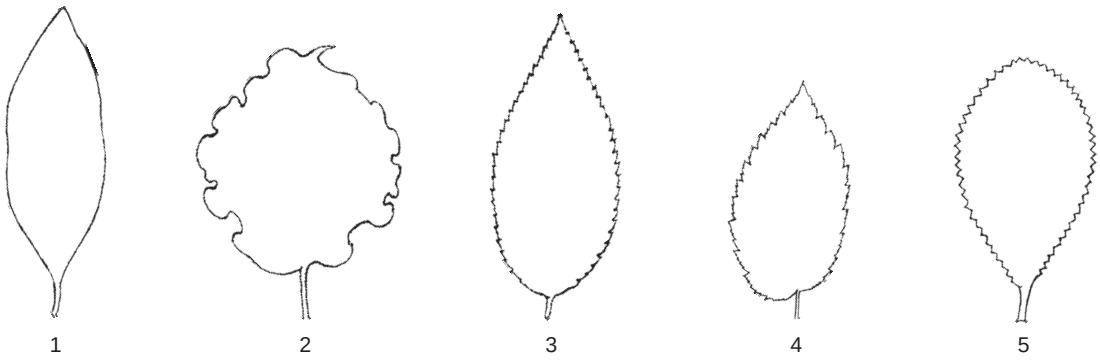

Fig. 5. Leaf margin

6.1.18 Leaf size

Recorded on plants exposed to full sunlight

1	Small	(<5 cm in length / 3 cm width)
2	Medium	(5-10 cm in length / 3-7 cm width)
3	Large	(>10 cm in length / >7 cm width)
99	Other	(specify in descriptor **6.5 Notes**)

★ **6.1.19 Length of mature leaf** [cm]

Recorded on the 5th leaf below the apical bud. Average of five leaves

★ **6.1.20 Width of mature leaf** [cm]

Recorded on the 5th leaf from the apical bud of flushing shoot. Measured at the maximum breadth. Average of five leaves

6.1.21 Leaf angle

Between 5th leaf and the internode above

1 Acute
2 Right
3 Obtuse

6.1.22 Leaf venation

Mid rib / venation. Particularly with reference to lateral veins

1 Indistinct and appears sunken in lamina
2 Distinct with bullations

6.1.23 Leaf vestiture

Observed on the lower surface

1 Glabrous
2 Appressed
3 Pubescent
4 Villous

6.1.23.1 Leaf pubescence

Recorded on the abaxial side of the first leaf (average number of hairs per microscopic field)

3 Sparse
5 Intermediate
7 Dense

★ **6.1.24 Leaf pose (angle)**

Observed on plants exposed to full sunlight

1	Erect (acute)	(<35°)
2	Semi-erect (obtuse)	(35° - 75°)
3	Horizontal (right)	(76° - 90°)
4	Drooping	(>90°)

6.1.25 Leaf waxiness

0	Absent
1 (or +)	Present

6.1.26 Petiole colour

1 Green (green group 139 A, 133 A, 137 C)
2 Yellow-green (yellow-green group 144 A to 147 A)
3 Green with grey purple tinge (green group 133A, greyed-purple group 186 B)
99 Other (specify in descriptor **6.5 Notes**)

6.1.27 Length of mature leaf petiole [cm]
Recorded on the third leaf from the apical bud of flushing shoot. Average of five leaves

★ **6.1.28 Shoot density**
On mature bush basis for two years (alternatively correlation between mature bush and the selected clone)

1	Sparse	(≤4)
2	Intermediate	(5 - 9)
3	Dense	(≥10)

6.1.29 Young shoot colour

1 Green
2 Bronze
3 Red
99 Other (specify in descriptor **6.5 Notes**)

6.1.30 Young shoot pubescence

3 Sparse
7 Dense

★ **6.1.31 Flushing behaviour**
Both unpruned and unplucked bushes

1 Early starters
2 Mid-season starters
3 Late starters
4 Prolonged flushes

6.1.31.1 Number of flushes completed in one year

6.1.31.2 Crop distribution

1 First flush
2 Second flush
99 Other (specify in descriptor **6.5 Notes**)

6.1.31.3 Base temperature growth (12.5°C)

0 Absent
1(or +) Present

6.2 Inflorescence and flower

Record data on unpruned and unplucked plants. (See Fig. 6)

6.2.1 Flowering behaviour

1 Terminal
2 Axillary

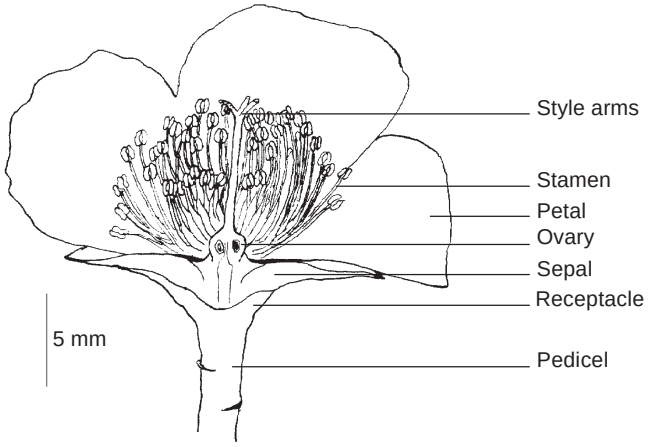

Fig. 6. Flower characteristics

6.2.2 Flowering habit

1 Flowers solitary
2 Clusters

6.2.3 Flower bud size

Observed on at least 10 flowers. Record the stage of measurement (e.g. unopened flowers)

3 Small
5 Intermediate
7 Large

6.2.4 Flower diameter

Observed on at least 10 completely developed open flowers

3 Small
5 Intermediate
7 Large

6.2.5 Number of flushes per flowering season

(Flushing cycles)

6.2.6 Pedicel colour

1 Green (green group 138 B)
2 Red-purple (red-purple group 60 B)
3 Purple (purple group 78 B)
99 Other (specify in descriptor **6.5 Notes)**

6.2.7 Pedicel length

3 Short
5 Intermediate
7 Long

6.2.8 Pedicel pubescence

(Density per microscopic field)

3 Sparse
5 Intermediate
7 Dense

6.2.9 Bracteoles number

6.2.10 Bracteoles position

In relation to flower

1 Alternate
2 Opposite
3 Middle
99 Other (specify in descriptor **6.5 Notes**)

6.2.11 Calyx

6.2.11.1 Number of sepals

6.2.11.2 Calyx pubescence

(Density per microscopic field)

3 Sparse
5 Intermediate
7 Dense

6.2.11.3 Calyx margin

1 Ciliate
2 Wavy
99 Other (specify in descriptor **6.5 Notes**)

6.2.11.4 Calyx type

1 Imbricate
2 Free

6.2.12 Receptacle

6.2.12.1 Receptacle shape

1 Spheroid
2 Globose
99 Other (specify in descriptor **6.5 Notes**)

6.2.12.2 Receptacle diameter

3 Narrow
5 Intermediate
7 Wide

6.2.13 Corolla

6.2.13.1 Corolla colour

Observed on completely developed open flowers

1 White (white group 155 D)
2 Cream (yellow-white group 158 B)
3 White with red purple (pinkish) tinge (yellow-white group 158 B with red-purple group 62 A)
4 Purple (pink) to purple-violet (purple group 78 B to purple-violet group 80 B)
99 Other (specify in descriptor **6.5 Notes**)

6.2.13.2 Corolla shape

1 Shallowly cup shaped
2 Broad oval
3 Suborbicular
99 Other (specify in descriptor **6.5 Notes**)

6.2.13.3 Corolla pubescence

(Density per microscopic field)

3 Sparse
5 Intermediate
7 Dense

6.2.13.4 Number of petals

6.2.14 Androecium

6.2.14.1 Number of stamens

6.2.14.2 Attachment of filament to anther

1 Basal
2 Adaxial
3 Lateral

6.2.14.3 Filament length [mm]

6.2.14.4 Anther length [mm]

★ **6.2.15 Relative height between androecium and gynoecium**

1 Same height
2 Androecium higher than gynoecium
3 Gynoecium higher than androecium

6.2.16 Gynoecium

6.2.16.1 Ovary type

1 Bilocular
2 Trilocular
99 Other (specify in descriptor **6.5 Notes**)

6.2.16.2 Ovary pubescence

(Density per microscopic field)

3 Sparse
5 Intermediate
7 Dense

6.2.16.3 Stigma

1 Linear
2 Apical

6.2.16.4 Stigma position

1 Extrorse
2 Introrse
3 Coplanar

6.2.16.5 Style

1 Ascending
2 Geniculate
3 Terminal

★ #### 6.2.16.6 Splitting of style

1 Geniculate (free for greater part of their length)
2 Ascending (free for about half their length)
3 United for greater part of the length, the free part short, more or less horizontal (terminal)

6.2.16.7 Stylar arms

1 Spreading horizontal
2 Semi-cleft

6.2.16.8 Carpel position

1 Superior (hypogynous)
99 Other (specify in descriptor **6.5 Notes**)

6.3 Fruit

6.3.1 Fruit shape

Recorded at maturity. Average of 10 fruits

1 Rhomboid (coccate)
2 Round
3 Roundish
99 Other (specify in descriptor **6.5 Notes**)

6.3.2 Fruit length [mm]

Recorded at the longest part. Average of 10 fruits

6.3.3 Fruit diameter [mm]

Recorded at the broadest part. Average of 10 fruits

6.3.4 Thickness of carpodermis

3 Thin
5 Intermediate
7 Thick

6.3.5 Number of seeds per fruit (capsule)

Average of 10 fruits

6.3.6 Capsule colour

Recorded at maturity

1 Generally brown (brown group 200 A)
99 Other (specify in descriptor **6.5 Notes**)

6.4 Seed

6.4.1 Seed colour

1 Grey orange (greyed-orange group 166 A)
2 Greyed-green (greyed-green group 197 B)
3 Greyed-orange with mottling (greyed-orange group 177 A)
99 Other (specify in descriptor **6.5 Notes**)

6.4.2 Seed shape

1 Round
2 Spherical
3 Ovoid
99 Other (specify in descriptor **6.5 Notes**)

6.4.3 Seed texture

1 Plain
2 Mottling

6.5 Notes

Any additional information, especially in the category of 'other' under various descriptors above, may be specified here

EVALUATION

7. Plant descriptors

★ **7.1 Pruned status of the plant**

0 No (Unpruned)
1(or +) Yes (Pruned)

★ **7.1.1 Type of prune/skiff**

1 Light skiff
2 Medium skiff
3 Deep skiff
4 Level skiff and unpruned
5 Exceptional cases collar prune
99 Other (specify in descriptor **7.7 Notes**)

7.1.2 Height from ground level [cm]

Record the height at which the knife is applied at the time of pruning/skiffing

7.2 Agronomic characteristics

7.2.1 Flowering density

3 Low
5 Intermediate
7 High

7.2.2 Number of days to fruiting (capsule) [d]

Development time from flowering

7.3 Anatomical features

7.3.1 Sclereids

0 Absent
1(or +) Present

★ **7.3.2 Distribution of sclereids**

1 Lower epidermis
2 Upper epidermis
99 Other (specify in descriptor **7.7 Notes**)

★ **7.3.3 Morphology of sclereids**

7.3.3.1 Wall lining

7.3.3.1.1 Smooth texture

0 No
1 (or +) Yes

7.3.3.1.2 Thick-walled

0 No
1 (or +) Yes

7.3.3.2 Lumen

1 Very narrow
2 Constricted
3 Broad lumen (without constrictions)

7.3.3.3 Length of sclereid

3 Short
7 Long

7.3.3.4 Shape of sclereid

1 Narrow
2 Acuminate at the apex
99 Other (specify in descriptor **7.7 Notes**)

7.3.3.5 Spicules

0 Absent
1(or +) Present

★ **7.3.4 Dorsal leaf surface impressions**

As a technique for classification of species and cultivars and in the verification of species purity or determination of hybrid status

7.3.4.1 Type of stomata

1 Paracytic
2 Anomocytic
99 Other (specify in descriptor **7.7 Notes**)

7.3.4.1.1 Distribution of stomata

3 Sparse
7 Dense

7.3.4.2 Shape of guard cell

7.3.4.3 Size of guard cell

3 Small
7 Large

7.3.4.4 Shape of subsidiary cell

7.3.4.5 Size of subsidiary cell

3 Small
7 Large

7.3.4.6 Epidermal appendages

0 Absent
1(or +) Present

7.3.4.6.1 Distribution of epidermal appendages

3 Sparse
7 Dense

7.3.4.7 Gland and corky cells

0 Absent
1(or +) Present

7.3.4.7.1 Distribution of glands and corky cells

3 Sparse
7 Dense

7.3.4.8 Other

Specify distinctive inclusion bodies - e.g. shape and size of other epidermal cells - in descriptor **7.7 Notes**

7.3.5 Number of layers of palisade parenchyma

7.4 Fruit characteristics

7.4.1 Fruit weight (capsule) [g]

Average of 10 fruits

7.4.2 100-seed weight [g]

Recorded taking into account only the sinkers

7.5 Chemical evaluation

7.5.1 Type of manufacture

1 Black (orthodox or CTC)
2 Steaming Green Tea (Kabusecha / Tencha / Tamaryokucha / Bancha)
3 Panning or Roasted Green Tea (Urestinocha / Aoyagicha)
4 Semi-fermented (oolong) (Pauchong / Oolong)
5 Scented tea (Jasmine / Zhulan / Osman)
99 Other (specify in descriptor **7.7 Notes**)

7.5.2 Moisture content [% FW]
- **7.5.2.1 Green tea leaves (two leaves and bud)**
  - **7.5.2.1.1 Water soluble solids** [% FW]
  - **7.5.2.1.2 Chlorophyll a** [mg/g FW]
  - **7.5.2.1.3 Chlorophyll b** [mg/g FW]
- **7.5.2.2 Made tea** [% FW]
  - **7.5.2.2.1 Water soluble solids**

7.5.3 Amino acid content [% FW]
- **7.5.3.1 Amino acid pattern**

7.5.4 Lipid content [% DM]

7.5.5 Polyphenol content [% DM]

7.5.6 Carbohydrates type
1 Non-fibrous
2 Fibre (crude)

7.5.7 Caffeine content [% FW]

7.5.8 Ascorbic acid content [mg/100 g FW]

7.5.9 Fermentation rate
Determined by chloroform test
3 Slow
5 Intermediate
7 Fast

★ **7.5.10 Theaflavin content (TF)** [%]
In case of orthodox, CTC, different grades of oolong tea

★ **7.5.11 Thearubigin content (TR)** [%]
In case of orthodox, CTC, different grades of oolong tea

7.5.12 Theophyllin content [% DM]

7.5.13 Theogallin content (TG) [% DM]

7.5.14 β-carotene content [% FW]

7.5.15 Catechins content [% DM]

7.5.15.1 Epicatechin (EC)

7.5.15.2 Gallocatechin (GC)

7.5.15.3 Epigallocatechin (EGC)

7.5.15.4 Epicatechin gallate (ECG)

7.5.15.5 Epigallocatechin gallate (EGCG)

7.5.16 Absence/Presence of sasanquin

0 Absent

1(or +) Present

7.5.17 Theobromine content [% DW]

1 < 0.1

2 0.1 to 0.3

3 > 0.3

7.5.18 Theanine content [% DW]

1 < 0.1

2 0.1 to 0.3

3 > 0.3 to 1

4 > 1

★ **7.5.19 Quality type**

1 Volatile component viz. Linalool, Methyl salicylate, Geraniol, Linalool oxides II

2 [(z) furanoid, Hexanol)]

★ **7.5.20 Terpene Index** (TI)

TI = Total peak area of [(linalool + linalool oxides (IV)]

Total peak area of [(linalool + linalool oxides (IV) + geraniol + (E) - geranic acid)]

7.5.21 Tasters' report average

Based on colour, brightness, strength and flavour

3 Poor

5 Intermediate

7 Good

7.5.21.1 Tasters' report on colour

7.5.21.2 Tasters' report on brightness

3 Dull

7 Bright

7.5.21.3 Tasters' report on strength

3 Weak
7 Strong

7.5.21.4 Tasters' report on flavour

7.6 Processing

7.6.1 Green tea leaf processing

1 Green tea
2 Oolong tea
3 Black tea
99 Other (specify in descriptor **7.7 Notes**)

7.6.2 Order of preference to manufacturing process

1 CTC (Cut Tear & Curl)
2 Orthodox
3 CTC and orthodox
4 CTC or orthodox
99 Other (specify in descriptor **7.7 Notes**)

★ **7.6.3 Quality in preferred process of 7.6.2**

1 Average
2 Good
3 Superior
4 Distinctive Darjeeling flavour
99 Other (specify in descriptor **7.7 Notes**)

7.7 Notes

Specify here any additional information

8. Abiotic stress susceptibility

Scored under artificial and / or natural conditions, which should be clearly specified. These are coded on a susceptibility scale from 1 to 9:

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

★ **8.1 Low temperature**

8.2 High temperature

8.3 Water salinity

8.4 Drought

It can be caused by either a low soil water content or a low atmospheric humidity (high saturation vapour pressure deficit)

8.5 High soil moisture

8.6 High humidity

★ 8.7 Reaction to soil acidity

8.8 Reaction to soil salinity

8.9 Mineral deficiencies

1	Zinc	5	Potassium
2	Magnesium	6	Nitrogen
3	Manganese	99	Other (specify in descriptor **8.10 Notes**)
4	Boron		

8.10 Notes

Specify here any additional information

9. Biotic stress susceptibility

In each case, it is important to state the origin of the infestation or infection, i.e. natural, field inoculation, laboratory. Record such information in descriptor **9.4 Notes**. These are coded on a susceptibility scale from 1 to 9, viz.:

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

9.1 Diseases

	Causal organism	Disease or common name
9.1.1	*Armillaria mellea*	Root splitting, root split disease
9.1.2	*Botrytis cinerea*	Grey mould
9.1.3	*Botryodiplodia theobromae*	Diplodia disease
9.1.4	*Cephaleuros parasiticus*	Red rust
9.1.5	*Ceratobasidium* sp., *Corticium invisum*	Black root
9.1.6	*Cercosporella theae*	Brown round spot, green leaf spot
9.1.7	*Cylindricladium ilicicola*	Nursery disease

9.1.8	*Elsinoe leucospila*	White scab
9.1.9	*Exobasidium vexans*	Blister blight
9.1.10	*Exobasidium reticulatum*	Net blister blight
9.1.11	*Fomes lamaensis, Fomes noxius*	Brown root rot
9.1.12	*Ganoderma pseudoferreum*	Wine red root disease
9.1.13	*Glomerella cingulata*	Brown blight
9.1.14	*Gloeosporium theae-sinensis*	Anthracnose
9.1.15	*Hypoxylon serpens*	Wood rot, Black wood rot
9.1.16	*Macrophoma theicola*	Stem canker
9.1.17	*Marasmius equicrinis*	Horse hair blight
9.1.18	*Pestalotia longiseta*	Grey blight, shoot blight
9.1.19	*Phomopsis theae*	Collar and branch canker
9.1.20	*Poria hypolateritia*	Red root rot
9.1.21	*Poria hypobrunnea*	Branch canker
9.1.22	*Pseudomonas syringae*	Bacterial shoot blight
9.1.23	*Pythium* sp.	Pythium root rot of cuttings
9.1.24	*Rhizoctonia solani*	Rhizoctonia disease
9.1.25	*Rosellinia arcuata*	Black root rot
9.1.26	*Septobasidium bogoriense*	Velvet blight
9.1.27	*Sphaerostilbe repens*	Violet root rot
9.1.28	*Tunstallia aculata*	Thorny stem blight
9.1.29	*Ustulina deusta (zonata)*	Charcoal stump rot

9.2	**Pests**	**Pest or common name**
9.2.1	*Acaphylla theae*	Pink mite
9.2.2	*Acaphyllisa parindiae*	Eriophyid mite
9.2.3	*Adoxophyes* sp.	Smaller tea tortix
9.2.4	*Andraca bipunctata*	Bunch caterpillar
9.2.5	*Ascotis selinaria*	Mugwort looper
9.2.6	*Attacus atlas*	Atlas moth
9.2.7	*Biston supressaria*	Common looper caterpillar
9.2.8	*Brevipalpus californicus, Brevipalpus phoenici*	Scarlet mite
9.2.9	*Calacarus carinatus*	White mite, Purple mite
9.2.10	*Caloptilia theivora, Gracilaria theivora*	Tea leaf roller
9.2.11	*Cydia leucostoma, Laspyresia leucostoma*	Tea flush worm
9.2.12	*Empoasca flavescens*	Jassid (green fly), Top green leaf hopper
9.2.13	*Empoasca onukii*	Tea green leaf hopper
9.2.14	*Eriochiton theae*	Scale insect
9.2.15	*Eterusta magnifica*	Red slug caterpillar
9.2.16	*Glyptotermis dilatatus*	Termite
9.2.17	*Haplothrix griseatus*	Cerambycid stem borer
9.2.18	*Helopeltis theivora*	Tea mosquito bug
9.2.19	*Homona coffearia*	Tortix caterpillar
9.2.20	*Homona magnanima*	Oriental tea tortix

9.2.21	*Hyposidra talaca*	Twig caterpillar
9.2.22	*Indarvela theivora*	Common bark eating caterpillar
9.2.23	*Lachuosterna impressa*	Common white grub
9.2.24	*Microcerotermes* spp.	Live wood eating termite, termite
9.2.25	*Meloidogyne brevicauda*	Root-knot nematode
9.2.26	*Neotermes greeni*	Live wood termite
9.2.27	*Oligonychus coffeae*	Red spider mite
9.2.28	*Odontotermes* spp.	Scavenger
9.2.29	*Parasa pastoralis, Setora nitens*	Nettle grub
9.2.30	*Poecilocoris latus*	Tea seed bug
9.2.31	*Pseudaulacaspis pentagona*	Mulberry scale
9.2.32	*Polyphagotarsonemus latus*	Yellow mite
9.2.33	*Pratylenchus loosi*	Root lesion nematode
9.2.34	*Radopholus similis*	Burrowing nematode
9.2.35	*Rotylenchulus reniformis*	Reniform nematode
9.2.36	*Scirtothrips bisponosus, Taeniothrips setiventris, Toxoptera aurantii*	Thrips
9.2.37	*Scirtothrips dorsalis*	Yellow tea thrips, thrips, Assam thrips
9.2.38	*Tetranychus kanzawai*	Kanzawa spider mite
9.2.39	*Xyleborus fornicatus*	Shot hole borer
9.2.40	*Zonocerus elegans*	Elegant grasshopper

9.3 Viruses

9.3.1	Phloem necrosis virus
9.3.2	Mosaic virus

9.4 Notes

Specify here any additional information

10. Biochemical markers

10.1 Isozyme

For each enzyme, indicate the tissue analyzed and the zymogram type. A particular enzyme can be recorded as 10.1.1; 10.1.2, etc. Examples include: Acid phosphatase (ACPH); Esterases α and β (EST A and B); Isocitrate dehydrogenase (ICD); Malate dehydrogenase (MDH); Phosphogluconate dehydrogenase (PGD); Phosphoglucose isomerase (PGI); Phosphoglucose mutase (PGM); Peroxidases

10.2 Other biochemical markers

(e.g. Polyphenol profile)

11. Molecular markers

Describe any specific discriminating or useful trait for this accession. Report probe-enzyme combination analyzed. Below are listed some of the basic methods most commonly used

11.1 Restriction fragment length polymorphism (RFLP)

Report probe / enzyme combination (approach can be used for nuclear, chloroplast or mitochondrial genomes)

11.2 Amplified fragment length polymorphism (AFLP)

Report primer pair combinations and accurate molecular size of products (used for nuclear genomes)

11.3 DNA amplification fingerprinting (DAF); random amplified polymorphic DNA (RAPD); AP-PCR

Accurately report experimental conditions and molecular size of products (used for nuclear genomes)

11.4 Sequence-tagged microsatellites (STMS)

Report primer sequences, and accurate product sizes (can be used for nuclear or chloroplast genomes)

11.5 PCR-sequencing

Report PCR primer sequences, and derived nucleotide sequence (can be used for single copy nuclear, chloroplast or mitochondrial genomes)

11.6 Other molecular markers

12. Cytological characters

12.1 Chromosome number

12.2 Ploidy level

(2x, 3x, 4x, etc.)

12.3 Meiosis chromosome associations

Average of 50 microspore mother cells, observed during metaphase 1

12.4 Other cytological characters

13. Identified genes

Describe any known specific mutant present in the accession

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ANNEX I. MULTICROP PASSPORT DESCRIPTORS

This list of multicrop passport descriptors has been developed jointly by IPGRI and FAO to provide consistent coding schemes for common passport descriptors across crops. These descriptors aim to be compatible with future IPGRI crop descriptor lists and with the descriptors to be used for the FAO World Information and Early Warning System (WIEWS) on plant genetic resources.

The list should NOT be regarded as a minimum descriptor list, since many additional passport descriptors are essential for the description of crops and need to be recorded. This document lists an initial set of common passport descriptors at the multicrop level. At a later stage the list could be expanded with additional multicrop descriptors. For example, descriptors dealing with the use of germplasm are currently not included, but their suitability for inclusion at the multicrop level will be investigated. Future expansion could even result in the development of more specialized lists of common descriptors at the crop group level.

Printed here is the latest version of the list (1997) which contains two sections. The latter one (FAO WIEWS DESCRIPTORS) lists a number of optional descriptors used in the FAO WIEWS. The list provides descriptions of content and coding schemes, but also provides *suggested* fieldnames (in parentheses) that can assist in the computerized exchange of this type of data.

MULTICROP PASSPORT DESCRIPTORS

1. Institute code (INSTCODE)
Code of the institute where the accession is maintained. The codes consist of the 3-letter ISO 3166 country code of the country where the institute is located plus number or an acronym as specified in the Institute database that will be made available by FAO. Preliminary codes (i.e. codes not yet incorporated in the FAO Institute database) start with an asterisk followed by a 3-letter ISO 3166 country code and an acronym.

2. Accession number (ACCENUMB)
This number serves as a unique identifier for accessions and is assigned when an accession is entered into the collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number should never be reused. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN indicates an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system).

3. Collecting number (COLLNUMB)
Original number assigned by the collector(s) of the sample, normally composed of the name or initials of the collector(s) followed by a number. This item is essential for identify-ing duplicates held in different collections. It should be unique and always accompany subsamples wherever they are sent.

4. Genus (GENUS)
Genus name for taxon. Initial uppercase letter required.

5. Species (SPECIES)
Specific epithet portion of the scientific name in lowercase letters plus authority[1]. Following abbreviation is allowed: “sp.”

6. Subtaxa (SUBTAXA)
Subtaxa can be used to store any additional taxonomic identifier plus authority[1]. Following abbreviations are allowed: “ssp.” (for subspecies); “var.” (for variety); “convar.” (for convariety); “f.” (for form).

7. Accession name (ACCNAME)
Either a registered or other formal designation given to the accession. First letter uppercase. Multiple names separated with semicolon.

8. Country of origin (ORIGCTY)
Name of the country in which the sample was originally collected or derived. Use the ISO 3166 extended codes, (i.e. current and old 3 letter ISO 3166 country codes)

9. Location of collecting site (COLLSITE)
Location information below the country level that describes where the accession was collected starting with the most detailed information. Might include the distance in kilometers and direction from the nearest town, village or map grid reference point, (e.g. CURITIBA 7S, PARANA means 7 km south of Curitiba in the state of Parana)

[1] Authority is only provided at the most detailed taxonomic level

10. Latitude of collecting site (LATITUDE)

Degrees and minutes followed by N (North) or S (South) (e.g. 1030S). Missing data (minutes) should be indicated with hyphen (e.g. 10—S).

11. Longitude of collecting site (LONGITUDE)

Degrees and minutes followed by E (East) or W (West) (e.g. 07625W). Missing data (minutes) should be indicated with hyphen (e.g. 076—W).

12. Elevation of collecting site [m asl] (ELEVATION)

Elevation of collecting site expressed in meters above sea level. Negative values allowed.

13. Collecting date of original sample [YYYYMMDD] (COLLDATE)

Collecting date of the original sample where YYYY is the year, MM is the month and DD is the day.

14. Status of sample (SAMPSTAT)

1	Wild	0	Unknown
2	Weedy		
3	Traditional cultivar / Landrace	99	Other (Elaborate in REMARKS field)
4	Breeder's line		
5	Advanced cultivar		

15. Collecting source (COLLSRC)

The coding scheme proposed can be used at 2 different levels of detail: Either by using the global codes such as 1, 2, 3, 4 or by using the more detailed coding such as 1.1, 1.2, 1.3 etc.

1 Wild habitat	2 Farm	3 Market	4 Institute / Research organization
1.1 Forest / woodland	2.1 Field	3.1 Town	
1.2 Shrubland	2.2 Orchard	3.2 Village	
1.3 Grassland	2.3 Garden	3.3 Urban	0 Unknown
1.4 Desert / tundra	2.4 Fallow	3.4 Other exchange system	99 Other (Elaborate in REMARKS field)
	2.5 Pasture		
	2.6 Store		

16. Donor institute code (DONORCODE)

Code for the donor institute. The codes consist of the 3-letter ISO 3166 country code of the country where the institute is located plus number or an acronym as specified in the Institute database that will be made available by FAO. Preliminary codes (i.e. codes not yet incorporated in the FAO Institute database) start with an asterisk followed by a 3-letter ISO 3166 country code and an acronym.

17. Donor number (DONORNUMB)

Number assigned to an accession by the donor. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN indicates an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system).

18. Other number(s) associated with the accession (OTHERNUMB)

Any other identification number known to exist in other collections for this accession. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system). Multiple numbers can be added and should be separated with a semicolon.

19. Remarks (REMARKS)
The remarks field is used to add notes or to elaborate on descriptors with value "99" (=Other). Prefix remarks with the field name they refer to and a colon (e.g. COLLSRC: roadside). Separate remarks referring to different fields are separated by semicolons.

FAO WIEWS DESCRIPTORS

1. Location of safety duplicates (DUPLSITE)
Code of the institute where a safety duplicate of the accession is maintained. The codes consist of 3-letter ISO 3166 country code of the country where the institute is located plus number or an acronym as specified in the Institute database that will be made available by FAO. Preliminary codes (i.e. codes not yet incorporated in the FAO Institute database) start with an asterisk followed by a 3-letter ISO 3166 country code and an acronym. Multiple numbers can be added and should be separated with a semicolon.

2. Availability of passport data (PASSAVAIL)
(i.e. in addition to what has been provided)
0 Not available 1 Available

3. Availability of characterization data (CHARAVAIL)
0 Not available 1 Available

4. Availability of evaluation data (EVALAVAIL)
0 Not available 1 Available

5. Acquisition type of the accession (ACQTYPE)
1 Collected / bred originally by the institute
2 Collected / bred originally by joint mission / institution
3 Received as a secondary repository

6. Type of storage (STORTYPE)
Maintenance type of germplasm. If germplasm is maintained under different types of storage, multiple choices are allowed, separated by a semicolon (e.g. 2;3). (Refer to FAO / IPGRI Genebank Standards 1994 for details on storage type)
1 Short-term
2 Medium-term
3 Long-term
4 *In vitro* collection
5 Field genebank collection
6 Cryopreserved
99 Other (elaborate in REMARKS field)

Please forward your feedback on the use of this list to:
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