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INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

COTTON DESCRIPTORS (REVISED)

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PREFACE

In 1980, the IBPGR published a cotton (Gossypium spp.) descriptor list finalized by an IBPGR Working Group at its meeting in Rome, Italy in October 1979 (AGP:IBPGR/80/10). In preparation for reprinting, the IBPGR has revised the list to fit the standard format for descriptor lists.

This revised descriptor list for cotton supersedes the earlier list of 1980 (AGP:IBPGR/80/10). Descriptor numbers from the earlier list are cross-referenced by enclosing them in brackets following the descriptor in the revised list.

The IBPGR encourages the collection of data on the first four categories of this list: 1. Accession; 2. Collection; 3. and 4. Characterization and preliminary evaluation. The IBPGR endorses the information in categories 1-4 as the minimum that ideally should be available for any one accession. Other descriptors are given in categories 5 onwards that will enable the simple encoding of further characterization and evaluation data and which can serve as examples for the creation of additional descriptors in the IBPGR form by any user.

Although the suggested coding should not be regarded as the definitive scheme, this format has the full backing of the IBPGR and is promoted worldwide. The descriptor list given here provides an international format and thereby produces a universally understood 'language' for all plant genetic resources data. The adoption of this scheme for all data encoding, or at least the production of a transformation method to convert other schemes to the IBPGR format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication. This will greatly assist the utilization of germplasm throughout the international plant genetic resources network. 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.

Any suggestions for modifications will be welcomed by the IBPGR Secretariat, Rome.

DESCRIPTOR LIST FOR COTTON (REVISED)

The IBPGR now uses the following definitions in genetic resources documentation:

- (i) passport (accession identifiers and information recorded by collectors);
- (ii) characterization (consists of recording those characters which are highly heritable, can be easily seen by the eye and are expressed in all environments);
- (iii) preliminary evaluation (consists of recording a limited number of additional traits thought desirable by a consensus of users of the particular crop).

Characterization and preliminary evaluation will be the responsibility of the curators, while further characterization and evaluation should be carried out by the plant breeder. The data from further evaluation should be fed back to the curator who will maintain a data file.

The following internationally accepted norms for the scoring or coding of descriptor states should be followed as indicated below:

- (a) measurements are made according to the SI system. The units to be applied are given in square brackets following the descriptor;
- (b) many descriptors which are continuously variable are recorded on a 1-9 scale. 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 8 (Pest and disease susceptibility) 1 = extremely low susceptibility and 8 = high to extremely high susceptibility;
- (c) presence/absence of characters are scored as + (present) and 0 (absent);
- (d) for descriptors which are not generally uniform throughout the accession (e.g. mixed collection, genetic segregation) mean and standard deviation could be reported where the descriptor is continuous or mean and 'x' where the descriptor is discontinuous;

- (e) when the descriptor is inapplicable, '0' is used as the descriptor value, e.g. if an accession does not form flowers, 0 would be scored for the following descriptor

Flower colour

- 1 White
- 2 Yellow
- 3 Red
- 4 Purple

- (f) blanks are used for information not yet available;
- (g) standard colour charts, e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of Colour, Munsell Color Charts for Plant Tissues are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the NOTES descriptor, 11);
- (h) dates should be expressed numerically in the format DDMMYYYY, where

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

PASSPORT

1. ACCESSION DATA

1.1 ACCESSION NUMBER (3.1)

This number serves as a unique identifier for accessions and is assigned by the curator when an accession is entered into his collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number is still not available for re-use. Letters should occur before the number to identify the genebank or national system (e.g. MG indicates an accession comes from the genebank at Bari, Italy; PI indicates an accession within the USA system)

1.2 DONOR NAME (3.2)

Name of institution or individual responsible for donating the germplasm

1.3 DONOR IDENTIFICATION NUMBER (3.3)

Number assigned to accession by the donor

1.4 OTHER NUMBERS ASSOCIATED WITH THE ACCESSION
(other numbers can be added as 1.4.3 etc.)

Any other identification number known to exist in other collections for this accession, e.g. USDA Plant Inventory number (not collection number, see 2.1)

1.4.1 Other number 1

1.4.2 Other number 2

1.5 SCIENTIFIC NAME

1.5.1 Genus

1.5.2 Species (see Appendix I) (4.1)

1.6 PEDIGREE/CULTIVAR NAME (2.3)

Nomenclature and designations assigned to breeder's material

1.7 ACQUISITION DATE (2.1)

The date in which the accession entered the collection

1.8 DATE OF LAST REGENERATION OR MULTIPLICATION

1.9 ACCESSION SIZE

Approximate number of seeds of accession in collection

1.10 NUMBER OF TIMES ACCESSION REGENERATED

Number of regenerations or multiplications since original collection

1.11 TYPE OF MAINTENANCE

- 1 Vegetative
- 2 Seed
- 3 Both
- 4 Tissue culture

2. COLLECTION DATA

2.1 COLLECTOR'S NUMBER (1.1)

Original number assigned by collector 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 and should always accompany sub-samples wherever they are sent

2.2 COLLECTING INSTITUTE

Institute or person collecting/sponsoring the original sample

2.3 DATE OF COLLECTION OF ORIGINAL SAMPLE (1.2)

2.4 COUNTRY OF COLLECTION OR COUNTRY WHERE CULTIVAR/VARIETY BRED (1.3)

Use the 3-letter abbreviations supported by the Statistical Office of the United Nations. Copies of these abbreviations are available from the IBPGR Secretariat and have been published in the FAO/IBPGR Plant Genetic Resources Newsletter number 49

2.5 PROVINCE/STATE (1.4)

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

- 2.6 LOCATION OF COLLECTION SITE (1.5)
Number of kilometres and direction from nearest town, village or map grid reference (e.g. TIMBUKTU 7S means 7 km south of Timbuktu)
- 2.7 LATITUDE OF COLLECTION SITE (1.7)
Degrees and minutes followed by N (north) or S (south), e.g. 1030S
- 2.8 LONGITUDE OF COLLECTION SITE (1.8)
Degrees and minutes followed by E (east) or W (west), e.g. 7625W
- 2.9 ALTITUDE OF COLLECTION SITE (m) (1.6)
Elevation above sea level
- 2.10 COLLECTION SOURCE (1.9)
1 Wild
2 Farm land
3 Farm store
4 Backyard
5 Village market
6 Commercial market
7 Institute
8 Other (specify in the NOTES descriptor, 11)
- 2.11 STATUS OF SAMPLE (1.13)
1 Wild
2 Weedy
3 Breeder's line
4 Primitive cultivar/landrace
5 Advanced cultivar (bred)
6 Other (specify in the NOTES descriptor, 11)
- 2.12 LOCAL/VERNACULAR NAME (1.10)
Name given by farmer to cultivar/landrace/weed
- 2.13 NUMBER OF PLANTS SAMPLED
Approximate number of plants collected in the field to produce this accession
- 2.14 PHOTOGRAPH
Was a photograph taken of the accession or environment at collection?
0 No
+ Yes

2.15 TYPE OF SAMPLE

- 1 Vegetative
- 2 Seed
- 3 Both

2.16 ETHNIC GROUP (1.11)

Name of the tribe or ethnic community of the people living in the area of collection

2.17 CULTURAL PRACTICE (1.12)

Method of farming at the site of collection

- 1 Dryland
- 2 Irrigated

2.18 OTHER NOTES FROM COLLECTOR

Collectors will record ecological information

CHARACTERIZATION AND PRELIMINARY EVALUATION

3. SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE)

3.3 NAME OF PERSON(S) IN CHARGE OF CHARACTERIZATION

3.4 PLANTING DATE

3.5 HARVEST DATE

4. PLANT DATA

4.1 VEGETATIVE

4.1.1 Growth habit (4.2.1)

- 3 Prostrate
- 5 Compact
- 7 Erect

4.1.2 Colour of plant (4.2.2)

- 1 Green
- 2 Greenish purple (sun red)
- 3 Red

4.1.3 Hairiness (4.2.3)

- 0 Glabrous
- 3 Short hair
- 7 Long hair

4.1.4 Leaf shape (4.3)

- 1 Entire
- 2 Lobed

4.2 INFLORESCENCE AND FRUIT

4.2.1 Petal colour (4.4.1)

- 1 White
- 2 Cream
- 3 Light yellow
- 4 Yellow
- 5 Lavender

4.2.2 Petal spot (4.4.2)

- 0 Absent
- 3 Small
- 7 Large

4.2.3 Pollen colour (4.4.3)

- 1 Cream
- 2 Yellow

4.2.4 Sensitivity to photoperiodism (5.7)

- 0 Insensitive
- + Sensitive

4.2.5 Boll shape (4.5.1)

- 1 Round
- 2 Oval
- 3 Conical

4.2.6 Boll opening (4.5.2)

- 1 Normal
- 2 Intermediate
- 3 Storm-proof

4.3 SEED

4.3.1 Seed fuzz (4.6)

- 0 Naked
- 3 Sparse
- 7 Fuzzy

4.3.2 Fuzz colour (4.7)

- 1 White
- 2 Green
- 3 Grey
- 4 Brown (tan)

4.3.3 Lint colour (4.8)

- 1 White
- 2 Cream
- 3 Light brown
- 4 Brown

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY OF FURTHER CHARACTERIZATION AND EVALUATION

3.2 SITE (RESEARCH INSTITUTE) (5.1.1)

3.3 NAME OF PERSON(S) IN CHARGE OF CHARACTERIZATION (5.1.3)

3.4 PLANTING DATE (5.2)

5.5 HARVEST DATE

6. PLANT DATA

6.1 VEGETATIVE

6.1.1 Days to emergence (5.3)

Number of days from planting to 50% seedling emergence

6.1.2 Plant height [cm] (5.4)

The mean height of the main stem at the time of maturity

6.2 INFLORESCENCE AND FRUIT

6.2.1 Days to 50% flowering (5.5)

Number of days from planting to 50% of plants with first flower open

6.2.2 Days to 50% opening (5.6)

Number of days from planting to 50% opening

6.2.3 Boll characteristics (5.8)

Based on 50 undamaged boll samples at first picking

6.2.3.1 Locules per boll (5.8.1)

6.2.3.2 Seed cotton per boll [g] (5.8.2)

6.2.3.3 Lint percentage [%] (5.8.3)

6.2.3.4 Lint index [g] (5.8.4)

6.2.3.5 Seed index [g] (5.8.5)

6.3 SEED

6.3.1 Fibre length (5.9.1)

6.3.1.1 2.5% span

6.3.1.2 50% span

6.3.2 Fibre strength (5.9.2)

Based on 50 undamaged boll samples at first picking (use samples from 6.2.3)

6.3.2.1 T0 [g/tex] (5.9.2.1)

The fibre strength of a bundle of fibres measured on a stelometer with the 2 jaws holding the fibre bundle tightly oppressed

6.3.2.2 T1 [g/tex] (5.9.2.2)

The fibre strength of a bundle of fibres measured on a stelometer with the 2 jaws holding the fibre bundle separated by a 3-5 mm space

6.3.2.3 E1 [%] (5.9.2.3)

The percentage elongation at break of centre 3.5 mm of the fibre bundle measured for T1 strength on a stelometer

6.3.2 Fibre fineness (5.9.3)

6.3.2.1 Micronaire

The fineness of the sample taken from the ginned lint, but measured by a micronaire and expressed in standard (curvilinear scale) micronaire units

6.3.2.2 Maturity (specify instrument)

6.3.3 Yellowness (B) (5.9.4)

Hunter's B value as a measure of increasing yellowness of the cotton

6.3.4 Reflectance (RD) (5.9.5)

RD measures the percentage of reflectance (the higher the value, the lighter the cotton)

- 6.3.5 Seed composition (5.10)
Whole acid delinted seed on dry weight basis
- 6.3.5.1 Oil content [%] (5.10.1)
- 6.3.5.2 Protein content [%] (5.10.2)
- 6.3.5.3 Gossypol content [%] (5.10.3)

7. STRESS SUSCEPTIBILITY *

Scored on a scale of 1-9, where

- 3 Low susceptibility
5 Medium susceptibility
7 High susceptibility

- 7.1 LOW TEMPERATURE
- 7.2 HIGH TEMPERATURE
- 7.3 DROUGHT
- 7.4 EXCESS SOIL MOISTURE
- 7.5 SALINITY
- 7.6 SOIL ACIDITY

8. PEST AND DISEASE SUSCEPTIBILITY

In each case, it is important to state the origin of the infection or infestation, i.e., natural, field inoculation, laboratory test (specify). Record such information in the NOTES descriptor, 11

Scored on a scale of 1-9, where

- 3 Low susceptibility
5 Medium susceptibility
7 High susceptibility

* No cross references to descriptor numbers in the previous list (AGP:IBPGR/80/66) are made for Sections 7 onwards

8.1 PESTS

8.1.1	<u>Alabama argillacea</u>	Leaf worm
8.1.2	<u>Anthonomus grandis</u>	Boll weevil
8.1.3	<u>Aphis gossypii</u>	Cotton aphid
8.1.4	<u>Bemisia tabaci</u>	Sweet potato whitefly
8.1.5	<u>Campylomma spp.</u>	Plant bug
8.1.6	<u>Cosmophila auragoides</u>	Leaf worm
8.1.7	<u>C. flava</u>	Leaf worm
8.1.8	<u>Creontiades pallidus</u>	Plant bug
8.1.9	<u>Cryptophelebia leucotreta</u>	Bollworm
8.1.10	<u>Diparopsis castanea</u>	Bollworm
8.1.11	<u>D. watersi</u>	Bollworm
8.1.12	<u>Dysdercus spp.</u>	Boll bug
8.1.13	<u>Earias biplaga</u>	Thorny bollworm
8.1.14	<u>E. insulana</u>	Thorny bollworm
8.1.15	<u>E. vittella</u>	Thorny bollworm
8.1.16	<u>Eurystylus hellevogei</u>	Plant bug
8.1.17	<u>Eutinobothrus spp.</u>	Borer
8.1.18	<u>Frankliniella schultzei</u>	Flower thrips
8.1.19	<u>Heliothis armigera</u>	Bollworm
8.1.20	<u>H. virescens</u>	Tobacco budworm
8.1.21	<u>H. zea</u>	Bollworm
8.1.22	<u>Helopeltis schoutedeni</u>	Plant bug
8.1.23	<u>Hemitarsonemus latus</u>	Cotton tarsonemid mite
8.1.24	<u>Horcias nobilellus</u>	Plant bug

8.1.25	<u>Lygus hesperus</u>	Plant bug
8.1.26	<u>L. lineolaris</u>	Plant bug
8.1.27	<u>L. vosseleri</u>	Plant bug
8.1.28	<u>Megacoelum spp.</u>	Plant bug
8.1.29	<u>Nezara viridula</u>	Green boll bug
8.1.30	<u>Oligonychus gossypii</u>	Cotton spider
8.1.31	<u>Oxycarenus spp.</u>	Seed bug
8.1.32	<u>Pectinophora gossypiella S.</u>	Bollworm
8.1.33	<u>Peridontopyge spp.</u>	Millipede
8.1.34	<u>Podagrica spp.</u>	Altises
8.1.35	<u>Sacadodes pyralis</u>	Bollworm
8.1.36	<u>Spodoptera exigua</u>	Leaf worm
8.1.37	<u>S. littoralis</u>	Leaf worm
8.1.38	<u>S. litura</u>	Leaf worm
8.1.39	<u>Sylepta derogata F.</u>	Leaf worm
8.1.40	<u>Tetranychus neocaledonicus</u>	Red spider mite
8.1.41	<u>T. telarius</u>	Red spider mite
8.1.42	<u>T. turkestanii</u>	Red strawberry spider mite
8.1.43	<u>Tibiomus spp.</u>	Millipede
8.1.44	<u>Trips tabaci</u>	Onion thrips
8.1.45	<u>Zonocerus variegatus</u>	Locust-cricket
8.1.46	<u>Belonolaimus longicaudatus</u>	Sting nematode
8.1.47	<u>Meloidogyne incognita</u>	Rootknot nematode
8.1.48	<u>Rotylenchulus reniformis</u>	Reniform nematode
8.1.49	<u>Other</u> (specify in the NOTES descriptor, 11)	

8.2 FUNGI

- | | | |
|--------|---|------------------------------|
| 8.2.1 | <u>Alternaria tenuis</u> Auct. | Seed rot |
| 8.2.2 | <u>Ascochyta gossypii</u> Woionichin | Blight |
| 8.2.3 | <u>Ashbya gossypii</u>
(Ash. & Now) Guill. | Fiber stain |
| 8.2.4 | <u>Aspergillus flavus</u>
Lk. Fr. | Seed rot |
| 8.2.5 | <u>Aspergillus niger</u> V. Tregh | Seed rot |
| 8.2.6 | <u>Cerotelium desmium</u>
(Berk. & Br.) Arthur | Rust |
| 8.2.7 | <u>Colletotrichum</u> spp. | Boll rot |
| 8.2.8 | <u>C. gossypii</u>
South. | Seedling blight |
| 8.2.9 | <u>Diplodia gossypina</u> Cke. | Boll rot |
| 8.2.10 | <u>Fusarium</u> spp. | Seedling blight |
| 8.2.11 | <u>Fusarium moniliforme</u>
Sheldom | Seed, Boll rot |
| 8.2.12 | <u>F. oxysporum</u> Schl.f.
spp. <u>Vasinfectum</u> (Atk.) | Wilt |
| 8.2.13 | <u>Glomerella gossypii</u> Edg.
(= <u>Colletotrichum gossypii</u> South.) | Anthracnose |
| 8.2.14 | <u>Macrophomina phaseoli</u>
(Maubl.) Ashby | Seedling blight,
Root rot |
| 8.2.15 | <u>Mycophaerella areola</u>
Ehrlich & Wolf
(= <u>Famularia areola</u> Akt.) | Aerolate mildew |
| 8.2.16 | <u>Nematospora coryli</u> Feglion | Fiber stain |
| 8.2.17 | <u>Phymatotrichum omnivorum</u>
(Shear) Dug. | Root rot |
| 8.2.18 | <u>Physalospora rhodina</u>
(Berk & Curt) Cke. | Seedling blight |

- | | | |
|--------|--|--|
| 8.2.19 | <u>Puccinia cacabata</u>
<u>Arth. & Holw.</u> | Rust |
| 8.2.20 | <u>P. schedonnardi</u>
<u>Tell & Swing</u> | Rust |
| 8.2.21 | <u>P. stakmanii</u> Presley | Rust |
| 8.2.22 | <u>Phythium spp.</u> | Seedling blight |
| 8.2.23 | <u>Rhizopus arrhizus</u> Fischer | Seed rot |
| 8.2.24 | <u>R. nigricans</u> Ehr. | Seed rot |
| 8.2.25 | <u>Thanatephous cucumeris</u>
<u>(Franck) Donk</u>
<u>(= Rhizoctonia solani Kuhn.)</u> | Seedling blight |
| 8.2.26 | <u>Thielaviopsis basicola</u>
<u>(Berk. & Br.) Ferr.</u> | Root rot |
| 8.2.27 | <u>Venticillium dahliae</u> Kleb. | Wilt |
| 8.2.28 | <u>Other</u> (specify in the NOTES descriptor, 11) | |
| 8.3 | BACTERIA | |
| 8.3.1 | <u>Xanthomonas malvacearum</u>
<u>(E.F. Sm.) Dows</u> | Bacterial
blight,
Angular leaf
spot |
| 8.3.2 | <u>Other</u> (specify in the NOTES descriptor, 11) | |
| 8.4 | VIRUS AND MYCOPLASM | |
| 8.4.1 | <u>Anthocyanosis</u> | |
| 8.4.2 | <u>Blue disease</u> | |
| 8.4.3 | <u>Cotton mosaic (several forms)</u> | |
| 8.4.4 | <u>Leaf crumple</u> | |
| 8.4.5 | <u>Leaf curl</u> | |
| 8.4.6 | <u>Psyllosis (Pauroclephala gossypii)</u> | |
| 8.4.7 | <u>Virescence</u> | |
| 8.4.8 | <u>Other</u> (specify in the NOTES descriptor, 11) | |

9. ALLOENZYME COMPOSITION

This may prove to be a useful tool for identifying duplicate accessions

10. CYTOLOGICAL CHARACTERS AND IDENTIFIED GENES

11. NOTES

Give additional information where descriptor state is noted as 'Other' as, for example in descriptors 2.10 and 8.2.28. Also include here any further relevant information

LIST OF GOSSYPIUM SPECIES

GENOME 1/

C ₁	<u>Gossypium sturtianum</u> J.H. Willis
C _{1-n}	<u>G. sturtianum</u> var. <u>nandewarense</u> (Derera) Fryxell
"C ₂ "	<u>G. robinsonii</u> F. von Mueller
"C ₅ "	<u>G. costulatum</u> Todaro
"C ₈ "	<u>G. pulchellum</u> (C.A. Gardner) Fryxell
"C ₆ "	<u>G. populifolium</u> (Bentham) F. von Mueller ex Todaro
"C"	<u>G. pilosum</u> Fryxell
"C ₇ "	<u>G. cunninghamii</u> Todaro
"C ₃ "	<u>G. australe</u> F. von Mueller
"C ₉ "	<u>G. nelsonii</u> Fryxell
G ₁	<u>G. bickii</u> Prokhanovj
B ₂	<u>G. triphyllum</u> (Harvey) Hochreutiner
"D ₈ "	<u>G. trilobum</u> (Mociño & Sessé ex DeCandolle) Skovsted
D ₁	<u>G. thurberi</u> Todaro
D _{3-k}	<u>G. klotzschianum</u> Andersson
D _{3-d}	<u>G. davidsonii</u> Kellogg
D ₂₋₂	<u>G. harknessii</u> Brandegee
D ₂₋₁	<u>G. armourianum</u> Kearney
"D"	<u>G. turneri</u> Fryxell
D ₄	<u>G. aridum</u> (Rose & Standley) Skovsted
D ₉	<u>G. laxum</u> Phillips
D ₇	<u>G. lobatum</u> Gentry
D ₆	<u>G. gossypioides</u> (Ulbrich) Standley
D ₅	<u>G. raimondii</u> Ulbrich
A ₂	<u>G. arboreum</u> Linnaeus
A ₁	<u>G. herbaceum</u> Linnaeus
A	<u>G. herbaceum</u> var. <u>africanum</u> (Watt) Hutchinson & Ghose
B ₁	<u>G. anomalum</u> Wawra ex Wawra & Peyritsch
B ₄	<u>G. capitis-viridis</u> Mauer
E ₁	<u>G. stocksii</u> Masters in Hooker
E ₂	<u>G. somalense</u> (Gürke) Hutchinson
E ₄	<u>G. incanum</u> (Schwartz) Hillcoat
E ₃	<u>G. areysianum</u> Deflers
F ₁	<u>G. longicalyx</u> Hutchinson & Lee

TETRAPLOIDS

(AD) ₃	<u>G. tomentosum</u> Nuttall ex Seemann
	<u>G. lanceolatum</u> Todaro
(AD) ₁	<u>G. hirsutum</u> Linnaeus
(AD) ₂	<u>G. barbadense</u> Linnaeus
"(AD)"	<u>G. mustelinum</u> Miers ex Watt
AD	<u>G. darwinnii</u> Watt

1/ Genomes with quotes are questionable