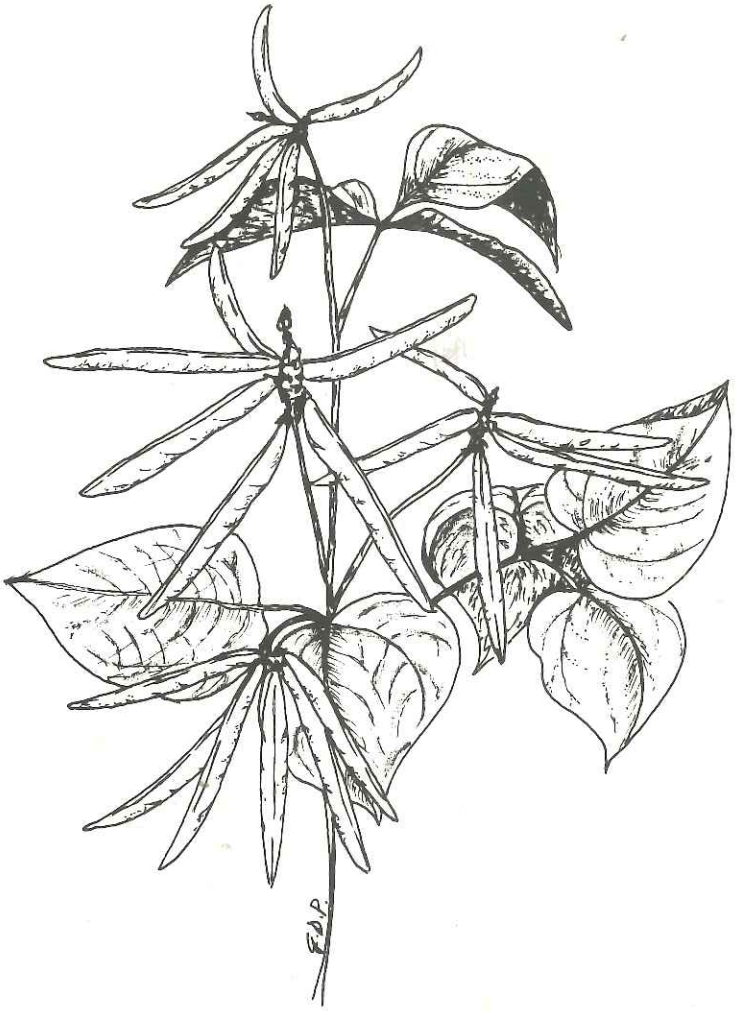

DESCRIPTORS FOR *VIGNA MUNGO* AND *V. RADIATA*

November 1985

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

DESCRIPTORS FOR VIGNA MUNGO AND V. RADIATA (REVISED)

IBPGR Secretariat
Rome, 1985

The International Board for Plant Genetic Resources (IBPGR) is an autonomous international scientific organization under the aegis of the Consultative Group on International Agricultural Research (CGIAR). The IBPGR was established by the CGIAR in 1974 and its Executive Secretariat is provided by the Food and Agriculture Organization of the United Nations. The basic function of the IBPGR is to promote and coordinate an international network of genetic resources centres to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world. The Consultative Group mobilizes financial support from its members to meet the budgetary requirements of the Board.

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PREFACE

The IBPGR published a descriptor list for mung bean in 1980. This list was prepared by a Working Group convened by the IBPGR Regional Committee in Southeast Asia (see AGP:IBPGR/80/35). Modification of the mung bean list was recommended by the IBPGR Ad Hoc Working Group on Vigna Species in the report of its September 1981 meeting (AGPG:IBPGR/81/82).

The IBPGR decided to combine the modified mung bean list with a descriptor list for black gram and publish them together in this document as one list to cover both crops. This descriptor list for Vigna mungo (L.) Hepper, urd bean or black gram, and V. radiata (L.) Wilczek, mung bean or green gram, is based upon draft lists prepared by the NBPGR, New Delhi, India.

This descriptor list supersedes the earlier IBPGR descriptor list for V. radiata (AGP:IBPGR/80/35). 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 VIGNA MUNGO AND V. RADIATA (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 Colour 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)

1.1 ACCESSION NUMBER

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 (1.4)

Name of institution or individual responsible for donating the germplasm

1.3 DONOR IDENTIFICATION NUMBER (1.5)

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 Introduction number (not collection number, see 2.1)

1.4.1 Other number 1

1.4.2 Other number 2

1.5 SCIENTIFIC NAME (1.2)

1.5.1 Genus

1.5.2 Species

1.5.3 Subspecies

1.5.4 Botanical variety

1.6 PEDIGREE/CULTIVAR NAME (1.3)

Nomenclature and designations assigned to breeder's material

1.7 ACQUISITION DATE

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

2. COLLECTION DATA (2.1)

2.1 COLLECTOR'S NUMBER

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 (2.3)

2.4 COUNTRY OF COLLECTION OR COUNTRY WHERE CULTIVAR/VARIETY BRED (2.4.1)

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 (2.4.2)

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

2.6 LOCATION OF COLLECTION SITE (2.4.4)

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 (2.4.6)

Degrees and minutes followed by N (north) or S (south), e.g. 1030S

2.8 LONGITUDE OF COLLECTION SITE (2.4.7)

Degrees and minutes followed by E (east) or W (west), e.g. 7625W

2.9 ALTITUDE OF COLLECTION SITE (m) (2.4.5)

Elevation above sea level

2.10 COLLECTION SOURCE (2.4.9)

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 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 (2.2)

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? If so, provide any identification number in the NOTES descriptor, 11

0 No
+ Yes

2.15 IF UNDER CULTIVATION: CULTURAL PRACTICE

Method of farming at the collection site

1 Dryland (Rainfed)
2 Irrigated

2.16 HERBARIUM SPECIMEN

Was a herbarium specimen collected? If so, provide any identification number in the NOTES descriptor, 11

0 No
+ Yes

2.17 OTHER NOTES FROM COLLECTOR

Collectors will record ecological information. For cultivated crops, cultivation practices such as irrigation, season of sowing, etc. will be recorded

If possible the following should be obtained from records:

Average annual rainfall [mm]
Average annual maximum temperature [°C]
Average annual minimum temperature [°C]

CHARACTERIZATION AND PRELIMINARY EVALUATION

3. SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE) (4.1.1)

3.3 NAME OF PERSON(S) IN CHARGE OF CHARACTERIZATION (4.1.2)

3.4 SOWING DATE

3.5 HARVEST DATES (1st, 2nd and 3rd harvests)

3.6 POPULATION DENSITY (4.1.3)

Number of plants per squere metre

4. PLANT DATA

4.1 VEGETATIVE

4.1.1 Hypocotyl colour (3.3)

At 10 days after emergence

1 Green
2 Green-purple
3 Purple
4 Dark purple
5 Mixed
6 Other (specify in the NOTES descriptor, 11)

4.1.2 Growth habit (3.1)

When first pod changes colour

1 Erect (straight and prominent main stem with few branches ascend)
2 Semi-erect (main stem less prominent; branches do not touch ground)
3 Spreading (branches touch ground)

4.1.3 Primary leaf shape

1 Ovate-lanceolate
2 Lanceolate
3 Other (specify in the NOTES descriptor, 11)

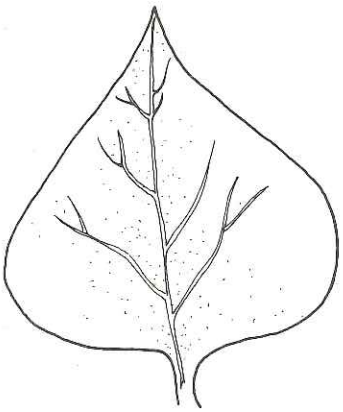
4.1.4 Terminal leaflet shape (3.4.1)

See Fig. 1

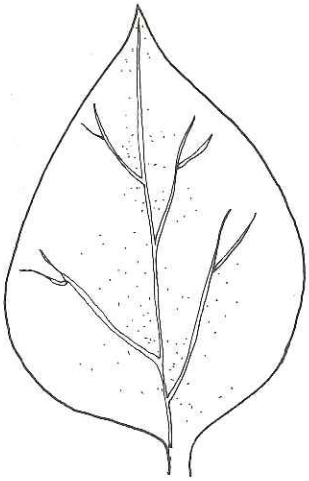
1 Deltate
2 Ovate
3 Ovate-lanceolate
4 Lanceolate
5 Rhombic
6 Obovate
7 Other (specify in the NOTES descriptor, 11)

4.1.5 Leaf pubescence (3.4.3)

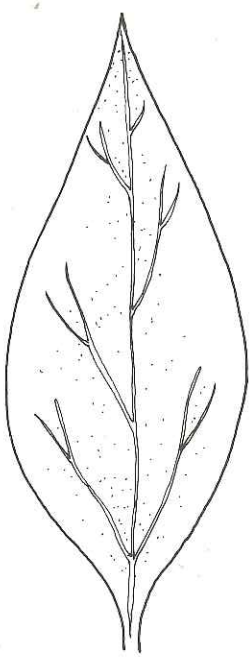
0 Glabrous
1 Very sparsely pubescent
3 Puberulent (sparsely pubescent)
5 Moderately pubescent
7 Densely pubescent



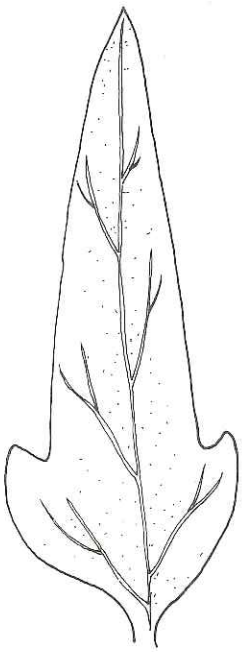
1 Deltate



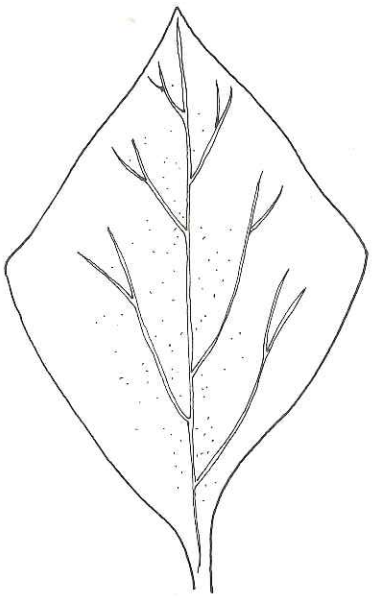
2 Ovate



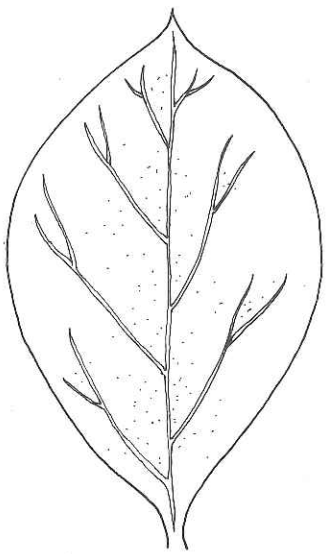
3 Ovate-lanceolate



4 Lanceolate



5 Rhombic



6 Obovate

Fig. 1 Terminal leaflet shape

4.1.6 Petiole colour (3.4.5)

1 Green
2 Green with purple spots
3 Greenish purple
4 Purple
5 Dark purple
6 Other (specify in the NOTES descriptor, 11)

4.1.7 Stem colour

1 Light green
2 Dark green
3 Light purple
4 Dark purple
5 Other (specify in the NOTES descriptor, 11)

4.2 INFLORESCENCE AND FRUIT

4.2.1 Raceme position (3.5.3)

When the first pod changes colour

1 Mostly above canopy
2 Intermediate
3 No pods visible above canopy

4.2.2 Pod attachment to peduncle (3.6.5)

When pods are full grown

3 Pendant
5 Sub-erect
7 Erect

4.2.3 Immature pod colour (3.6.1)

1 Light green
2 Dark green
3 Other (specify in the NOTES descriptor, 11)

4.2.4 Mature pod colour (3.6.3)

1 Straw
2 Tan
3 Brown
4 Brown and black
5 Black
6 Other (specify in the NOTES descriptor, 11)

4.3 SEED

4.3.1 Number of seeds per pod (7.2)

Mean number for 10 randomly selected pods

4.3.2 Seed shape (3.7.4)

1 Globose
2 Ovoid
3 Drum-shaped
4 Other (specify in the NOTES descriptor, 11)

4.3.3 Seed colour (3.7.1)

	V. mungo	V. radiata
1	Light green	Light green
2	Green-brown	Dark green
3	Brown	Green-yellow
4	Chocolate	Yellow
5	Black	Brown
6	Mottled	Mottled
7	Other:	Other:

(please specify in the NOTES descriptor, 11)

4.3.4 Lustre on seed surface (3.7.3)

0 Absent (dull)
+ Present (shiny)

4.3.5 Hilum (3.7.5)

1 Concave (deeply furrowed aril prominent)
2 Non-concave (aril not prominent)

4.3.6 1000 Seed weight (g) (7.3)

Weight of 100 randomly selected seeds x 10

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY OF FURTHER CHARACTERIZATION AND EVALUATION (4.1.1)

5.2 SITE (RESEARCH INSTITUTE) (4.1.1)

5.3 NAME OF PERSON IN CHARGE OF EVALUATION

5.4 SOWING DATE (4.1.2)

5.5 HARVEST DATES (first, second and third harvest)

5.6 POPULATION DENSITY (4.1.3)

Number of plants per square metre

6. PLANT DATA

6.1 VEGETATIVE

6.1.1 Days to emergence (4.2)

From sowing to 50% seedling emergence

6.1.2 Seedling vigour (4.4)

At 15 days after emergence

3 Poor
5 Intermediate
7 Vigorous

6.1.3 Growth pattern (3.2)

When first pod changes colour

1 Determinate (apical bud of main stem reproductive)
2 Indeterminate

6.1.4 Twining tendency (4.6)

When first pod changes colour

0 None
3 Slight
5 Intermediate
7 Pronounced

6.1.5 Primary leaf length

3	Short	(1.8 - 2.0 cm)
5	Intermediate	(2.4 - 2.6 cm)
7	Long	(3.0 - 3.2 cm)

6.1.6 Primary leaf width

3	Narrow	(0.3 - 0.4 cm)
5	Intermediate	(0.7 - 0.8 cm)
7	Broad	(1.1 - 1.2 cm)

6.1.7 Leaf colour (3.4.4)

Intensity of green colour of trifoliate leaves at 50% flowering

3 Light green
5 Intermediate green
7 Dark green

6.1.8 Leafiness (4.8)

At 50% flowering

3	Sparse	(main stem easily visible)
5	Intermediate	
7	Abundant	(very leafy)

6.1.9 Terminal leaflet length (3.4.2)

Recorded for the leaf at the fourth node

		V. mungo	V. radiata
3	Short	(2.6 - 4.5 cm)	(9.0 - 9.9 cm)
5	Intermediate	(6.6 - 8.5 cm)	(11.0 - 11.9 cm)
7	Long	(10.6 - 12.5 cm)	(13.0 - 13.9 cm)

6.1.10 Terminal leaflet width

Recorded for the leaf at the fourth node

3	Narrow	(1.6 - 2.5 cm)
5	Intermediate	(3.6 - 4.5 cm)
7	Broad	(5.6 - 6.6 cm)

6.1.11 Petiole length (3.4.8)

Recorded for the leaf at fourth node

		V. mungo	V. radiata
3	Short	(4.0 - 5.9 cm)	(10.0 - 11.9 cm)
5	Intermediate	(8.0 - 9.9 cm)	(14.0 - 15.9 cm)
7	Long	(12.0 - 13.9 cm)	(18.0 - 19.9 cm)

6.1.12 Leaf senscence (3.4.9)

When 50% of pods have dried

0 No visible senescence
3 Slight visible senescence
5 Moderate senescence
7 Conspicuous concurrent senescence

6.1.13 Number of primary branches (4.7.1)

When first pod changes colour. Count only pod-bearing branches whose origin is in the leaf axils on the main stem

6.1.14 Branch length (cm) (4.7.2)

Length of longest branch. When first pod changes colour

6.1.15 Branching pattern

1 Basal
2 Central
3 Top
4 All over

6.1.16 Plant height (cm) (4.5)

Mean of 10 randomly selected drawn-out plants

6.1.17 Nodulation (4.15)

0 None
3 Slight (poor)
5 Intermediate
7 Heavy

6.2 INFLORESCENCE AND FRUIT

6.2.1 Days to flowering (4.3)

From sowing to stage when 50% of plants have begun to flower

6.2.2 First pod-bearing node (3.5.1)

The node number starting from the unifoliate (primary leaf) node

6.2.3 Calyx colour (3.5.4)

1 Green
2 Purplish green
3 Greenish purple
4 Other (specify in the NOTES descriptor, 11)

6.2.4 Corolla colour (3.5.5)

Colour of wings and standard of freshly opened flowers

1 Yellow
2 Greenish yellow
3 Yellowish green
4 Green-purplish yellow
5 Other (specify in the NOTES descriptor, 11)

6.2.5 Photoperiodism of flowering

0 Insensitive
\+ Sensitive

6.2.6 Flowering period (4.9)

3 Asynchronous (flowering period 31-35 days)
5 Intermediate (flowering period 21-25 days)
7 Synchronous (flowering period 11-15 days)

6.2.7 Fruit-setting capacity [%] (4.10)

Percentage of flowers that set pods. When 50% of pods are mature

6.2.8 Peduncle length (3.5.2)

The length of the longest peduncle. When first pod changes colour

		V. mungo	V. radiata
3	Short	(3.3 - 4.5 cm)	(12.0 - 13.5 cm)
5	Medium	(5.9 - 7.1 cm)	(15.2 - 16.8 cm)
7	Long	(8.5 - 9.7 cm)	(18.5 - 20.0 cm)

6.2.9 Number of pod-bearing peduncles (4.11)

Number of peduncles having at least one fully grown pod at first harvest including both main stem and branches

6.2.10 Number of pods per plant (7.1)

Mean number of pods from 10 randomly selected plants

6.2.11 Colour of ventral suture of immature pod (3.6.2)

1 Light green
2 Dark green
3 Purple
4 Other (specify in the NOTES descriptor, 11)

6.2.12 Days to first mature pods (4.12)

From sowing to stage when 50% of plants have mature pods

6.2.13 Pod pubescence (3.6.7)

When first pod changes colour

0 Glabrous
3 Puberulent (sparsely pubescent)
5 Moderately pubescent
7 Densely pubescent

6.2.14 Pod length [cm] (3.6.6)

Mean of 10 randomly selected mature pods

6.2.15 Pod shattering in the field (4.13)

0 Absent
+ Present

6.2.16 Pod cross-section (3.6.4)

Of mature pod

1 Semi-flat
2 Round

6.2.17 Pod beak shape

1 Hook
2 Knob
3 Other (specify in the NOTES descriptor, 11)

6.2.18 Constriction of pod between seeds (3.6.8)

When pod changes colour

0 Absent
+ Present

6.3 SEED

6.3.1 Yield per plant [g] (7.4)

Mean weight of 10 randomly selected plants after drying in sun

6.3.2 Percentage of first harvest over total harvest [%] (7.5)

6.3.3 Protein content [%]

On dry seed weight bases

6.3.4 Tryptophane content [%]

6.3.5 Methionine content [%]

6.3.6 Lysine content [%]

6.3.7 Carbohydrate content [%]

6.3.8 Calcium content [%]

6.3.9 Phosphorus content [%]

7. STRESS SUSCEPTIBILITY

Evaluated under defined conditions. Scored on a 1-9 scale, where

3 Low susceptibility (high tolerance)
5 Medium susceptibility
7 High susceptibility (low tolerance)

7.1 LOW TEMPERATURE (8.5)

Measured as reduction in general vigour and productivity after being continuously exposed to an average temperature of 15°C for at least 15 days

7.2 HIGH TEMPERATURE (8.6)

Measured as yield reduction when continuously exposed to average of 40°C during the flowering period

7.3 DROUGHT (8.2)

7.4 HIGH SOIL MOISTURE

7.5 SALINITY (8.3)

7.6 SOIL ACIDITY (8.4)

8. PEST AND DISEASE SUSCEPTIBILITY *

Scored for natural or artificial infection or infestation on a 1-9 scale, where

3 Low susceptibility
5 Medium susceptibility
7 High susceptibility

8.1 PESTS

8.1.1	Amsacta spp.	Hairy caterpillars
8.1.2	Aphis spp.	Aphids
8.1.3	Aproaerema modicella Deventer	Groundnut leafminer

* Reference to descriptor numbers in previous list are not given in Section 8

8.1.4	Bemisia tabaci (Gennadius)	Whitefly
8.1.5	Callosobruchus spp.	Bruchids
8.1.6	Chauliopes fallax Scott	Bug
8.1.7	Corynea spp.	Blister beetles
8.1.8	Cydia spp.	Pod borer
8.1.9	Etiella zinckenella	Pod borer
8.1.10	Heliothis zea	Pod borer
8.1.11	Ostrinia turnacalis	Pod borer
8.1.12	Empoasca spp.	Leafhoppers
8.1.13	Gracillaridae	Leaf blotch miners
8.1.14	Longitarsis manilensis Weise	Flea beetle
8.1.15	Madurasia obscurella Jac.	Leaf beetle
8.1.16	Maruca testulalis (Geyer)	Legume pod borer
8.1.17	Mylabris spp.	Blister beetles
8.1.18	Nezara viridula L.	Green stink bug
8.1.19	Ootheca spp.	Foliage beetles
8.1.20	Ophiomyia phaseoli (Tryon)	Beanfly
8.1.21	Ophimyia centrosematis	Beanfly
8.1.22	Melanogromyza sojas	Beanfly
8.1.23	Spodoptera spp.	Leaf caterpillars
8.1.24	Heterodera spp.	Cyst nematodes
8.1.25	Meloidogyne spp.	Root-knot nematodes
8.1.26	Rotylenchus spp.	Reinform nematodes
8.1.27	Riptortus clavatus	Stink bug

	8.1.28	Piezodorus hybneri	Stink bug
	8.1.29	Others (specify in the NOTES descriptor, 11)	
8.2	FUNGI		
	8.2.1	Asochyta phaseolorum Sacc.	Asochyta blight
	8.2.2	Cercospora spp.	Cercopspora leaf spots
	8.2.3	Collectotrichum lindemuthanum (Sacc. & Magn.) Br. & Cav.	Anthracnose
	8.2.4	Colletotrichum spp.	Brown blotch
	8.2.5	Corynespora cassiicola (Berk. & Curt.) Wei	Target leaf spot
	8.2.6	Diplodia sp.	Pod rot
	8.2.7	Elsinoë spp.	Scab
	8.2.8	Erysiphe polygoni DC.	Powdery mildew
	8.2.9	Macrophomina phaseolina (Tassi) Goid.	Charcoal rot
	8.2.10	Protomycopsis phaseoli Rama, & Subr. (Entyloma vignae Batista)	Leaf smut
	8.2.11	Pythium aphanidermatum (Edson)Fitz.	Pythium stem rot
	8.2.12	Pythium aphanidermatum (Edson)Fitz.	Seedling mortality
	8.2.13	Rhizoctonia solani Kuehn (Thanatephorus cucumeris (Frank)Donk)	Seedling mortality
	8.2.14	Rhizoctonia solani Kuehn (Thanatephorus cucumeris (Frank)Donk)	Web blight
	8.2.15	Sclerotium rolfsii Sacc. (Corticium rolfsii Curzi)	Sclerotium stem rot
	8.2.16	Uromyces appendiculatus (Pers.)Unger	Brown rust

8.2.17 Phakosora pachyrhizi

8.2.18 Others (specify in the NOTES descriptor, 11)

8.3 BACTERIA

8.3.1	Pseudomonas phaseolicola (Burkh.)Dowson	Halo blight
8.3.2	Xanthomonas phaseoli (E.F. Sm.)Dowson	Bacterial blight, bacterial leaf spot

8.3.3 Others (specify in the NOTES descriptor, 11)

8.4 VIRUS AND MYCOPLASMA

8.4.1 Alfalfa mosaic virus

8.4.2 Azuki bean mosaic virus

8.4.3 Bean common mosaic virus

8.4.4 Bean yellow mosaic virus

8.4.5 Black gram sterility mosaic virus

8.4.6 Black gram mottle virus

8.4.7 Broad bean mottle virus

8.4.8 Cowpea aphid-borne mosaic virus

8.4.9 Cowpea (yellow) mosaic virus

8.4.10 Cucumber mosaic virus

8.4.11 Leaf curl virus

8.4.12 Mung bean mottle virus

8.4.13 Mung bean yellow mosaic virus

8.4.14 Mung bean yellow mottle virus

8.4.15 Tobacco streak virus

8.4.16 Tobacco ringspot virus

8.4.17 Witches' broom

8.4.18 Others (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 the descriptor state is noted as 'Other' as, for example, in descriptors 2.10 and 4.1.4. Also include here any further relevant information

APPENDIX I

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