

DESCRIPTORS FOR COWPEA

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INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

COWPEA DESCRIPTORS

IBPGR SECRETARIAT

Rome, 1983

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IBPGR descriptors lists are available for the following crops:

<i>Allium</i> (1982)	Oca (1982)
Almond (1981)	Pear (1983)
Amaranth (1981)	Pearl Millet (1981)
Apple (1982)	<i>Phaseolus vulgaris</i> (1982)
Apricot (1980)	<i>Pigeonpea</i> (1981)
Banana and Plantains (1978)	Potato cultivated (1977)
Barley (1982)	Quinoa (1981)
Beets (1980)	Rice (1980)
Cocoa (1981)	Safflower (1983)
Coconut (1978)	Sesame (1981)
Coffee (1980)	Sorghum (1980)
<i>Colocasia</i> (1980)	Sugarcane (1982)
Cotton (1980)	Sweet Potato (1981)
Groundnut (1981)	Tomatoes (1981)
Lupin / Lupinos (1981)	Tropical Fruits, revised (1980)
Maize (1980)	Winged Bean, revised (1982)
Mung Bean (1980)	Wheat, revised (1981)
	Yams (1980)

A full request list for IBPGR publications including Crop Reports, Descriptor Lists, Reports on Regions, Conservation and Information, Newsletters, Annual Reports and Germplasm Directories can be obtained from the IBPGR Secretariat, Rome.

PREFACE

This descriptor list for cowpea, *Vigna unguiculata* (L.) Walp., is based upon a list prepared by W.M. Steele.

This descriptor list has been prepared in an IBPGR standard format following advice on descriptors and descriptor states from the crop experts throughout the world. 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 for 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 plants genetic resource 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 effective means for information storage, retrieval and communication. This will greatly assist the utilization of germplasm throughout the international plant genetic resource network. It is recommended, therefore, that information should be produced by closely follow this descriptors list with regard to: ordering and numbering descriptors; using the descriptors specified; and using the descriptors states recommended.

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

DESCRIPTOR LIST FOR COWPEA

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

- i) **Passport data** (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 normally 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 crop coordinator 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 in metric units;
- 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 8. (Pest and disease susceptibility) 1 = extremely low susceptibility and 8 = high to extremely high susceptibility;
- c) Presence/absence of characters are scored as 1 (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. For example, if an accession does not form flowers, a '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).

PASSPORT

1 ACCESSION DATA

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 with the USA system)

1.2 DONOR NAME

Name of institution or individual responsible for donating the germplasm

1.3 DONOR IDENTIFICATION NUMBER

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

1.5.1 Genus

1.5.2 Species

1.5.3 Subspecies

1.5.4 Botanic Variety

1.6 PEDIGREE / CULTIVAR NAME

Nomenclature and designations assigned to breeder's material

1.7 ACQUISITION DATE

The month and year in which the accession entered the collection, expressed numerically, e.g. June = 06, 1981 = 18

1.8 DATE OF LAST REGENERATION OR MULTIPLICATION

The month and year expressed numerically, e.g. October = 10, 1978 = 78

1.9 ACCESSION SIZE

Approximate number of seeds or plants of accession in collection

1.10 NUMBER OF TIMES ACCESSION REGENERATED

Number of regenerations or multiplications since original collection

2 COLLECTION DATA

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

2.3.1 Month

2.3.2 Year

2.4 COUNTRY OF COLLECTION OR COUNTRY WHERE CULTIVAR / VARIETY BRED

Use the three 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 Resource Newsletter number 49

2.5 PROVINCE / STATE

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

2.6 LOCATION OF THE COLLECTING SITE

Number of kilometers and direction from nearest town, village or map grid reference (e.g. TIMBUKTU7S means 7 km south of TIMBUKTU)

2.7 LATITUDE OF COLLECTION SITE

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

2.8 LONGITUDE OF THE COLLECTING SITE

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

2.9 ALTITUDE OF THE COLLECTING SITE [m]

Elevation above sea level

2.10 COLLECTING SOURCE

- 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 Breeders line
- 4 Primitive cultivar (landrace)
- 5 Advanced cultivar (bred)
- 6 Other (specify in the Notes descriptor, 11)

2.12 LOCAL / VERNACULAR NAME

Name given by the 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
- 1 Yes

2.15 TOPOGRAPHY OF COLLECTION SITE

- 1 Swamp
- 2 Flood plain
- 3 Plain level
- 4 Undulating
- 5 Hilly
- 6 Mountainous
- 7 Other (specify in the Notes descriptor, 11)

2.16 LIGHT AT COLLECTION SITE

- 3 Shady
- 7 Sunny

2.17 SOIL TEXTURE AT COLLECTION SITE

- 1 Sandy
- 2 Loamy
- 3 Clay
- 4 Organic

- 5 Rocky
- 2.18 SOIL DRENAGE AT THE COLLECTING SITE**
- 3 Poor
- 7 Good

- 2.19 FREQUENCY AT COLLECTING SITE**
- 1 Rare
- 2 Occasional
- 3 Frequent
- 4 Abundant
- 5 Very abundant

- 2.20 GROWTH HABIT**
- 1 Determinate
- 2 Indeterminate bush
- 3 Indeterminate spreading not climbing
- 4 Indeterminate twining and climbing
- 5 Other (specify in the Notes descriptor, 11)

- 2.21 IF UNDER CULTIVATION: CROP**
- 1 Monoculture
- 2 Mixed with cereals
- 3 Mixed with root crops
- 4 Other (specify in the Notes descriptor, 11)

- 2.22 ORGANS USED AS PRIMARY PRODUCT**
- 1 Green fodder
- 2 Dry fodder
- 3 Grain

- 2.23 IF UNDER CULTIVATION: DENSITY**
- 3 Low
- 7 High

- 2.24 PESTS AND DISEASES OF COLLECTION SAMPLE**
- Specify, using the item numbers of the pests and diseases (Section 8) and severity of infection 1 – 9 scale. '0' indicates that the sample has no pests or diseases

- 2.25 HERBARIUM SPECIMEN**
- Was herbarium specimen collected?
- 0 No
- 1 Yes

- 2.26 OTHER NOTES FROM COLLECTOR**
- Collectors will record ecological information. For cultivated crops, cultivation practices such as irrigation, season of sowing, etc. will be recorded

CHARACTERIZATION AND PRELIMINAR EVALUATION DATA

3 SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE)

3.3 NAME OF PERSON IN CHARGE OF CHARACTERIZATION

3.4 SOWING DATE

3.4.1 Day

3.4.2 Month

3.4.3 Year

3.5 HARVEST DATE

3.5.1 Day

3.5.2 Month

3.5.3 Year

4 PLANT DATA

4.1 VEGETATIVE

4.1.1 Growth habit

Evaluated in the 6th week after sowing

- 1 Acute erect (branches form acute angles with main stem)
- 2 Erect (branching angle less acute than above)
- 3 Semi-erect (branches perpendicular to main stem, but not touch ground)
- 4 Intermediate (most lower branches touch the ground)
- 5 Semi-prostrate (main stem reaches 20 or more centimeters)
- 6 Prostrate (plants flat on ground; branches spread several meters)
- 7 Climbing

4.1.2 Growth pattern

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

4.1.3 Twinning tendency

0	None
3	Slight
5	Intermediate
7	Pronounced

4.1.4 Plant pigmentation

Recorded for stem, branches, petioles and peduncles in the 6th week after sowing

0	None
1	Very slight
3	Moderate at the base and tips of petioles
5	Intermediate
7	Extensive
9	Solid

4.1.5 Terminal leaflet shape

Recorded for the terminal leaflet of a young, mature leaf in the 6th week after sowing

1	Globose
2	Sub-globose
3	Sub-hastate
4	Hastate

4.1.6 Plant hairiness

Of stems, leaves and pods

		Reference
3	Glabrescent	Most cultivars
5	Short appressed hairs	var. pubescens
7	Pubescent to hirsute	var. protracta

4.2 INFLORESCENCE AND FRUIT

4.2.1 Days to flowering

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

Recorded for plants with the same sowing date, at the same location, each year

4.2.2 Raceme position

Recorder when peduncles have reached full length

1	Mostly above canopy
2	In upper canopy
3	Throughout canopy

4.2.3 Days to first mature pods

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

4.2.4 Pod attachment to peduncle

Recorded when pods are full grown

- 3 Pendant
- 5 30 – 90° down from erect
- 7 Erect

4.2.5 Immature pod pigmentation

Pattern of pigment distribution on full grown immature pods

- 0 None
- 1 Pigmented tip
- 2 Pigmented sutures
- 3 Pigmented valves, green sutures
- 4 Splashes of pigment
- 5 Uniformly pigmented
- 6 Other (specify in the notes descriptor, 11)

4.2.6 Pod curvature

Of mature pods

- 0 Straight
- 3 Slightly curved
- 5 Curved
- 7 Coiled

4.2.7 Pod length [cm]

Mean of the 10 longest mature pods from 10 randomly selected plants

4.2.8 Number of locules per pod

Mean number of the 10 pods measured for length in 4.2.7

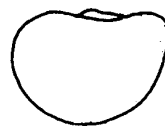
4.3 SEED

4.3.1 Seed Shape (See figure 1)

1	Kidney	4	Globose
2	Ovoid	5	Rhomboid
3	Crowder		



Kidney



Ovoid



Crowder



Globose



Rhomboid

Fig. 1 Seed shape

4.3.2 Testa texture

- 1 Smooth
- 3 Smooth to rough
- 5 Rough (fine reticulation)
- 7 Rough to wrinkled
- 9 Wrinkled (coarse folds on the testa)

4.3.3 Eye pattern

The shape of the pigment pattern which surrounds the hilum. The 'front' of the hilum is the non-micropylar end. Diagrams illustrating the following descriptor states are available from the Genetic Resources Unit at International Institute of Tropical Agriculture (IITA); Ibadan, Nigeria (where a large number of sub-divisions of each state are in use)

		Group
0	Absent	A¹
1	Very Small	A
2	Kabba group (Eye fills the narrow groove all around the hilum, and the body has some form of speckling. A blue halo is also found around the hilum)	K
3	Narrow eye (Hilum Ring. Eye fills the narrow groove around the hilum and spills out of this groove in front of the hilum for a short distance and has an indistinct front margin)	N
4	Small eye (eye has a distinct margin, but is smaller than Holstein group)	E
5	Holstein group (eye encircles the back of the hilum in a narrow ring, widens at the sides, and then extends margin of the eye is very distinct)	H
6	Watson group (eye encircles the back of the hilum as a narrow ring, widens at the sides and spills over the non – micropylar end of the seed with an indistinct margin. The extra width at the sides of the hilum distinguishes this group from 3, narrow eye)	W
7	Self coloured (eye covers entire seed)	S
8	Other (specify in the Notes descriptor, 11)	

¹ If the eye pattern is recorded as 0 or 1 (Group A), then eye colour (4.3.9) is always likewise recorded as 0 or 1 (Group W)

4.3.4 Eye colour

		Group
0	Eye absent (white, cream)	W ²
1	Brown splash or gray	W
2	Tan Brown	T
3	Red	R
4	Green	G
5	Blue to black	B
6	Blue to black spots or mottle	X
7	Speckled (even distribution of fine speckling)	S
8	Mottled (dark brown pigment typically Absent around hilum)	M
9	Mottled and speckled (Victor)	V
10	Other (specify in the Notes descriptor, 11)	

4.3.5 Seed weight [mg]

Weight of 100 seeds moisture content 12%

FURTHER CHARACTERIZATION AND EVALUATION

5 SITE DATA

5.1 COUNTY OF FURTHER CHARACTERIZATION AND EVALUATION

5.2 SITE (RESEARCH INSTITUTE)

5.3 NAME OF PERSON IN CHARGE OF EVALUATION

5.4 SOWING DATE

5.4.1 Day

5.4.2 Month

5.4.3 Year

5.5 HARVEST DATA

5.5.1 Day

5.5.2 Month

² Group W (states 0 and 1) is only used in combination with Group A (states 0 and 1) for eye pattern (4.3.8)

5.5.3 Year

6 PLANT DATA

6.1 VEGETATIVE

6.1.1 Hypocotyl length [mm]

Mean of 10 plants

6.1.2 Leaf colour

Intensity of green colour

3	Pale Green
5	Intermediate green
7	Dark green

6.1.3 Leaf marking

Presence/absence of V-mark on leaflets

0	Absent
1	Present

6.1.4 Terminal leaflet length [mm]

Terminal leaflet whose shape was recorded in 4.1.5

6.1.5 Terminal leaflet width [mm]

The widest dimension of the terminal leaflet whose shape was recorded in 4.1.5

6.1.6 Leaf texture

1	Cariaceous
2	Intermediate
3	Membranous

6.1.7 Stipule length [mm]

6.1.8 Stipule width [mm]

6.1.9 Number of main branches

The branches whose origin is in the leaf axils on the main stem; recorded in the 8th week after sowing. Mean of 10 randomly selected plants

6.1.10 Number of nodes on main stem

Recorded 3 – 4 weeks after sowing. Mean of 10 randomly selected plants

6.1.11 Plant vigour

Based on plant width and height 3 – 4 weeks after sowing

- | | |
|---|--|
| 3 | Non-vigorous (height less than 37 cm and width less than 75 cm) |
| 5 | Intermediate (height greater than 37cm or width greater than 75 cm) |
| 7 | Vigorous (height greater than 37 cm and width greater than 75 cm) |
| 9 | Very vigorous (height greater than 50 cm and width greater than 1 m) |

6.1.12 Leaf–stem ratio

Weight of leaves divided by weight of other parts of shoot

6.1.13 Percentage dry weight

Percentage of dry matter in 500 g sample of green plant

6.1.14 Yield of green matter

Average yield in grams of 10 randomly selected plants weighed at 50% flowering

6.1.15 Capacity for re-growth

Weight of green matter in grams at 50% flowering after the accession has been cut at six week stage

6.1.16 *In vitro* dry matter digestibility

Digestibility of green fodder at 50% flowering

6.2 INFLORESCENCE AND FRUIT

6.2.1 Flowering pigment pattern

Of newly opened flowers

- | | |
|---|---|
| 0 | Not pigmented (white) |
| 1 | Wing pigmented; standard with light V-shaped pattern of pigment at top center |
| 2 | Pigmented margins on wing and standard |
| 3 | Wing pigmented; standard lightly pigmented |
| 4 | Wing with pigmented upper margin; standard is pigmented |
| 5 | Completely pigmented |
| 6 | Other (specify in the Notes descriptor, 11) |

6.2.2 Flower colour

- 1 White
- 2 Violet
- 3 Mauve–pink
- 4 Other (specify in the Notes descriptor, 11)

6.2.3 Standard length [mm]

A measure of flowers size; the mean length of 10 freshly opened, randomly selected standard petals

6.2.4 Calyx lobe length [mm]

6.2.5 Duration of flowering

Days from first flowers to stage when 50% of plants have finished flowering

6.2.6 Number of racemes per plant

Mean of 10 randomly selected plants

6.2.7 Peduncle length [mm]

Recorded when peduncles have grown full length. Mean length of 10 peduncles, one from each of 10 randomly selected plants

6.2.8 Number of pods per peduncle

Recorded under total insect control. Mean of 10 randomly selected peduncles

6.2.9 Number of pods per plant

Mean number of mature pods from 10 randomly selected plants

6.2.10 Pod width [cm]

Mean width of the 10 pods measured for length in 4.2.10

6.2.11 Pod wall thickness

- 3 Thin
- 5 Intermediate
- 7 Thick

6.2.12 Pod colour

Of mature pod

- 1 Pale tan or straw
- 2 Dark tan
- 3 Dark brown
- 4 Black or dark purple
- 5 Other (specify in the Notes descriptor, 11)

6.3 SEED

6.3.1 Seed length [mm]

Mean of 10 mature seeds excluding those from the extremities of pods

6.3.2 Seed width [mm]

Mean width from hilum to keel of the 10 seeds measured for length in 6.3.1

6.3.3 Seed thickness [mm]

Mean thickness of the 10 seeds measured for length in 6.3.1; measured perpendicular to length and width

6.3.4 Seed crowding

A visual estimate of seed compression, being indicative of spacing within the pod

0	Not crowded (no compression of seed ends)
3	Semi-crowded (slight flattening of seed ends)
5	Crowded (marked compression of seed ends)
7	Extremely crowded (seed width greater than seed length)

6.3.5 Splitting of testa

0	Absent
1	Present (testa split exposing cotyledons)

6.3.6 Attachment of testa

0	Testa not firmly attached to seed
1	Testa firmly attached to seed

6.3.7 Percentage seed protein

7 STRESS SUSCEPTIBILITY

Scored on a 1-9 scale, where

3	Low susceptibility
5	Medium susceptibility
7	High susceptibility

7.1 LOW TEMPERATURE

7.2 HIGH TEMPERATURE

7.3 DROUGHT

7.4 HIGH SOIL MOISTURE

8 PEST AND DISEASE SUSCEPTIBILITY³

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

- 3 Low susceptibility
- 5 Medium susceptibility
- 7 High susceptibility

8.1 PESTS

8.1.1	<i>Acanthomia horrida</i> <i>Acanthomia tomentosicollis</i> <i>Anoplocnemis curvipes</i> <i>Riptortus dentipes</i>	Coried bugs
8.1.2	<i>Alcidodes leucogrammus</i>	Striped bean weevil
8.1.3	<i>Aphis craccivora</i>	Cowpea aphid
8.1.4	<i>Aphis fabae</i>	Pea aphid
8.1.5	<i>Callosobruchus chinensis</i> <i>Callosobruchus maculatus</i>	Cowpea storage weevil
8.1.6	<i>Chalcodermus aeneus</i>	Cowpea curculio
8.1.7	<i>Chrysolagria</i> spp.	Beetle
8.1.8	<i>Cydia ptychora</i>	Pod borer
8.1.9	<i>Empoasca Kerri</i> <i>Empoasca signata</i> <i>Empoasca</i> spp.	Leaf hoppers
8.1.10	<i>Epilachna</i> spp.	Epilachna beetles
8.1.11	<i>Etiella zinckenella</i>	Lima bean pod borer
8.1.12	<i>Heliothis armigera</i>	African bollworm
8.1.13	<i>Lagria villosa</i>	Beetle

³ For information on pests and diseases see Singh, S.R. , and D.J. Allen, 1980. Pests, Diseases, Resistance and Protection in Cowpeas, p. 419 – 443 to Advances in Legume Science, Ed. By R.J. Summerfield and A.H. Bunting. Royal Botanic Gardens, Kew, Surrey, England.

8.1.14	<i>Maruca testulalis</i>	Legume pod borer
8.1.15	<i>Matsumuraeses phaseoli</i>	Adzuki pod borer
8.1.16	<i>Medythia quaterna</i>	Striped foliage beetle
8.1.17	<i>Megalurothrips sjostedti</i>	Flower thrips
8.1.18	<i>Mylabris</i> spp.	Blister beetle
8.1.19	<i>Nezara viridula</i>	Green stink bug
8.1.20	<i>Oothea bennigseni</i> <i>Oothea mutabilis</i>	Foliage beetles
8.1.21	<i>Piezotrachelus varius</i>	Pod weevil
8.1.22	<i>Sericothrips occipitalis</i>	Foliage thrips
8.1.23	<i>Spodoptera littoalis</i>	Egyptian leaf worm
8.1.24	Other (specify in the Notes descriptor, 11)	

8.2 FUNGI

8.2.1	<i>Ascochyta phaseolorum</i> Sacc.	Ascochyta blight
8.2.2	<i>Cercospora canescens</i> Ellis & Martin <i>Cercospora cruenta</i> Sacc.	Cercospora leaf spot
8.2.3	<i>Choanephora</i> spp.	Lamb's tail pod rot
8.2.4	<i>Collectrichum capisici</i> <i>Colletotrichum truncatum</i> (Schw.) Andrus & Moore	Brown blotch
8.2.5	<i>Collectrichum</i> <i>Lindemuthianum</i> (sacc. & Magn.) Bri. & Cav.	Anthracnose
8.2.6	<i>Corynespora cassiicola</i>	Target leaf spot
8.2.7	<i>Elsinoë phaseoli</i> Jenkins	Scab
8.2.8	<i>Erysiphe polygoni</i> DC.	Powdery mildew

8.2.9	<i>Fusarium oxysporum</i> Shlect	Fusarium wilt
8.2.10	<i>Fusarium solani</i> (Mart) Appel & Wollenw	Fusarium collar and stem rot
8.2.11	<i>Phakosora pachyrizi</i> Syd.	Pink rust
8.2.12	<i>Phytophthora cactorum</i> (Leb. & Cohn) Schroet <i>Phytophthora vignae</i>	Phytophthora stem rot
8.2.13	<i>Protomyces phaseoli</i>	Leaf smut
8.2.14	<i>Pythium aphanidermatum</i> (Edson) Fritz.	Pythium stem rot
8.2.15	<i>Pythium aphanidermatum</i> (Edson) Fritz.	Seedling mortality
8.2.16	<i>Rhizoctonia solani</i> Kuehn	Seedling mortality
8.2.17	<i>Rhizoctonia solani</i> Kuehn	Web blight
8.2.18	<i>Sclerotium rolfsii</i> Sacc.	Sclerotium stem rot
8.2.19	<i>Septoria vignae</i> <i>Septoria vignicola</i>	Septoria leaf spot
8.2.20	<i>Synchytrium dolichi</i>	False rust
8.2.21	<i>Uromyces appendiculatus</i>	Brown rust
8.2.22	<i>Verticillium albo-atrum</i> Reinke & Berth	Verticillium wilt
8.2.23	Others (specify in the Notes descriptors, 11)	

8.3 BACTERIA

8.3.1	<i>Xanthomonas vignicola</i> Burkh.	Bacterial light and canker
8.3.2	Others (specify in the Notes descriptor, 11)	

8.4 VIRUS AND MICROPLASM

- 8.4.1 Cowpea aphid-borne mosaic
- 8.4.2 Cowpea banding mosaic
- 8.4.3 Cowpea chlorotic mottle
- 8.4.4 Cowpea golden mosaic
- 8.4.5 Cowpea mild mottle
- 8.4.6 Cowpea mottle
- 8.4.7 Cowpea ringspot
- 8.4.8 Cowpea (severe) mosaic
- 8.4.9 Cowpea (yellow) mosaic
- 8.4.10 Cucumber mosaic
- 8.4.11 Southern bean mosaic
- 8.4.12 Sunn-hemp mosaic
- 8.4.13 Others (specify in the Notes descriptors, 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, 4.2.5, etc. Also include here any further relevant information

APPENDIX

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