

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

DESCRIPTORS FOR PHASEOLUS COCCINEUS

IBPGR SECRETARIAT
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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, which was established by the CGIAR in 1974, is composed of its Chairman and 16 members; its Executive Secretariat is provided by the Food and Agriculture Organization of the United Nations. The basic function of the IBPGR, as defined by the Consultative Group, is to promote 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

According to archaeological findings, *Phaseolus coccineus* L. was probably domesticated 2,200 years ago in the Tehuacan Valley in Mexico. Although it is cultivated as an annual, *P. coccineus* grows perennially in its natural habitats in the cool, humid uplands of Guatemala in altitudes of about 1,800 m. Hybrids of *P. vulgaris* ♀ × *P. coccineus* ♂ can be produced easily, while a reciprocal cross is produced only with difficulty. *P. coccineus* is an open-pollinated species with no barriers to self-pollination.

This descriptor list for *P. coccineus* has been prepared in an IBPGR standard format following advice on descriptors and descriptor states from the crop experts throughout the world (see Appendix). 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 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 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 this 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 PHASEOLUS COCCINEUS

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 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 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 + (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, 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 in the NOTES descriptor, 11).

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 within 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 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

1.5.3 Subspecies (See Figure 1.)

<<I>> p04.gif Figure 1. Sepals and bracteoles of subspecies of *Phaseolus coccineus*

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 = 81

1.7.1 Month

1.7.2 Year

1.8 DATE OF LAST REGENERATION OR MULTIPLICATION

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

1.8.1 Month

1.8.2 Year

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 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

Expressed numerically, e.g. March = 03, 1980 = 80

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 Resources 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 COLLECTION SITE

Number of kilometres 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 COLLECTION SITE

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

2.9 ALTITUDE OF COLLECTION SITE

Elevation above sea level in metres

2.10 COLLECTION 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 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

2.14.1 Photograph number

If photo has been taken provide any identification number/system in the NOTES descriptor, 11)

2.15 HERBARIUM SPECIMEN

Was a herbarium specimen collected?

- 0 No
- + Yes

2.16 HABITAT

(If wild material)

- 1 Cloud forest

- 2 Pine-oak forest
- 3 Tropical forest
- 4 Pine savannah
- 5 Grasslands
- 6 Sand desert
- 7 Stream bank
- 8 Other (specify in the NOTES descriptor, 11)

2.17 GROWTH HABIT

- 1 Determinate
- 2 Indeterminate semi-climber
- 3 Indeterminate climber

2.18 IF UNDER CULTIVATION-CROP

- 1 Monoculture
- 2 Mixed cropping (specify companion crop in the NOTES descriptor, 11)
- 3 Relay cropping
- 4 Backyard crop

2.19 TOPOGRAPHY

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

2.20 CROPPING DENSITY

(If cultivated material)

- 3 Low (less than 45,000/ha)
- 5 Intermediate
- 7 High (more than 50,000/ha)

2.21 PESTS AND DISEASES OF COLLECTION SAMPLE

Specify, using item numbers of pests and diseases (Section 8) and severity of infection on 1-9 scale. '0' indicates that sample has no pests or diseases.

2.22 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 PRELIMINARY 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 Type of germination

- 3 Hypogeal (cotyledons remain below ground)
- 5 Intermediate
- 7 Epigeal (cotyledons are raised above ground)

4.1.2 Hypocotyl or epicotyl colour (seedling)

- 1 Green
- 2 Red
- 3 Purple
- 4 Mixed

4.1.3 Leaflet length

Measured on the terminal leaflet of third trifoliolate leaf-from pulvinus to leaf tip

- 3 Short (4 to 5 cm)
- 5 Intermediate (8 to 9 cm)
- 7 Long (12 to 13 cm)

4.1.4 Leaflet shape

Measured on the terminal leaflet of third trifoliolate leaf according to the ratio of length (l) to width (w).
See Figure 2.

	<u>l/w</u>
1 Round	<1.5
3 Ovate	1.5-2
5 Ovate-lanceolate	2-3
7 Lanceolate	3-6
9 Hastate	>6

<<I>> p11.gif Figure 2. Leaflet shape

4.1.5 Growth pattern

- 1 Determinate
- 2 Indeterminate semi-climber
- 3 Indeterminate climber

4.2 INFLORESCENCE AND FRUIT

4.2.1 Size of bracteole

Freshly opened flowers

- 3 Small (1/2 to 2/3 length of calyx)
- 5 Intermediate (equal or slightly longer)
- 7 Long (1/2 to once longer)

4.2.2 Shape of bracteole

- 1 Ligulate
- 2 Ovate-acuminate
- 3 Nearly round

4.2.3 Colour of standard

Opened flower

- 1 Pure white
- 2 White with pink nervation
- 3 Pink
- 4 Orange
- 5 Scarlet
- 6 Violet
- 7 Purple
- 8 Mixed

4.2.4 Shape of stigma

See Figure 3

- 1 Introrse (polyanthus)
- 2 Terminal
- 3 Extrorse

<<I>> p12.gif Figure 3. Shape of stigma

4.2.5 Pod pattern

Presence of pattern on fully expanded immature pod

- 0 Absent
- + Present

4.2.6 Colour of pod pattern

- 0 Pod pattern absent
- 1 Red
- 2 Violet
- 3 Black

4.2.7 Pod length

In cm, average of 20 randomly chosen mature pods. If pods are curved, measure the longest straight line from base to tip of pods

4.3 SEED

4.3.1 Seed coat pattern

- 0 Seed pattern absent
- 1 Monocoloured pattern
- 2 Bicoloured pattern
- 3 Mixture of different colours

4.3.2 Type of seed coat pattern

See Figure 4

- 0 Seed pattern absent
- 1 Flecked
- 2 Striped
- 3 Intensively striped
- 4 Almost continuous
- 5 Speckled
- 6 More than one of the above, e.g. 1+5 (specify in the NOTES descriptor, 11)
- 7 Other (specify in the NOTES descriptor, 11)

<<I>> p14.gif Figure 4. Type of seed coat pattern

4.3.3 Background colour of seed coat

- 1 White
- 2 Off-white
- 3 Grey
- 4 Buff
- 5 Brown
- 6 Red
- 7 Violet
- 8 Dark violet
- 9 Black
- 10 Mixed

4.3.4 Colour of seed coat pattern

If bicoloured pattern, enter lighter colour; darker colour should be entered under 6.3.1.

- 0 Seed pattern absent
- 1 White
- 2 Brown
- 3 Red

- 4 Violet
- 5 Dark violet

4.3.5 Seed shape-ratio length/width

See Figure 5

- 3 1.3 to 1.4
- 5 1.7 to 1.8
- 7 2.1 to 2.2

<<I>> p15a.gif Figure 5. Seed shape-ratio length/width

4.3.6 Seed shape-ratio length/thickness

See Figure 6

- 3 Globular (1.4 or less)
- 5 Ovate (1.7 to 1.8)
- 7 Flat (2.1 to 2.2)
- 9 Very flat (2.5 or greater)

<<I>> p15b.gif Figure 6. Seed shape-ratio length/thickness

4.3.7 Seed shape-outline

See Figure 7

- 1 Kidney
- 2 Blocked or rectangular
- 3 Other (specify in the NOTES descriptor, 11)

<<I>> p16.gif Figure 7. Seed shape-outline

4.3.8 Hilum shape

- 1 Linear
- 2 Oval

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY 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 DATE

5.5.1 Day

5.5.2 Month

5.5.3 Year

6. PLANT DATA

6.1 VEGETATIVE

6.1.1 Days to emergence

Number of days from planting

6.1.2 Emerging cotyledon colour

- 1 Green
- 2 Intermediate
- 3 Red or purple

6.1.3 Seedling vigour

First trifoliate leaf fully expanded

- 3 Low
- 5 Intermediate
- 7 High (vigorous)

6.1.4 Distance from cotyledon scar to primary leaves

In cm; measured after primary leaves are fully expanded

6.1.5 Clear markings along veins of fully developed primary leaves

- 0 Absent
- 3 Narrow
- 7 Wide

6.1.6 Leaf anthocyanin

- 0 Absent
- + Present

6.1.7 Leaf colour: intensity of green colour

4-6 weeks after planting

- 3 Pale green
- 5 Intermediate green
- 7 Dark green

6.1.8 Leaf hairiness: density

On inner face of first fully expanded leaves from tip

- 0 Glabrous
- 3 Slightly pubescent
- 5 Moderately pubescent
- 7 Highly pubescent

6.1.9 Anthocyanin pigmentation on main stem

4-6 weeks after planting

- 0 Absent
- 3 Low (localized to nodes)
- 5 Intermediate
- 7 High

6.1.10 Number of branches

- 3 Low (few)
- 5 Intermediate
- 7 High (many)

6.1.11 Secondary branch orientation

- 1 Vertical or oblique
- 2 Horizontal

6.1.12 Growth type

- 1 Small bush
- 2 Large bush
- 3 Semi-vine - short runner
- 4 Semi-vine - long runner
- 5 Climbing vine - medium size
- 6 Climbing vine - large size

6.1.13 Days to maturity

Number of days from emergence until 90% of pods are mature

6.1.14 Leaf persistence

When 90% of pods are ripe

- 3 Few leaves remaining
- 5 Intermediate
- 7 Most leaves remaining

6.1.15 Life span

- 1 Annual
- 2 Perennial from swollen stem base
- 3 Perennial from tuberous roots

6.1.16 Type of roots

- 1 Fibrous
- 2 Heavily thickened
- 3 Tuberous

6.1.17 Root nodulation

Number of nodules

- 0 No nodules
- 3 Low (few)
- 5 Intermediate
- 7 High (many)

6.2 INFLORESCENCE AND FRUIT

6.2.1 Flower bud size

Just before opening

- 3 Small (approximately 5 mm)
- 5 Medium (7 to 8 mm)
- 7 Large (approximately 10 mm)

6.2.2 Flower bud shape

Just before opening, see Figure 6

- 3 Globular
- 5 Intermediate
- 7 Long

<<I>> p20.gif Figure 8. Flower bud shape

6.2.3 Days to flowering

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

6.2.4 Number of nodes on mainstem to first inflorescence

The number of nodes starting from the unifoliate node. Average of 10 plants

6.2.5 Number of nodes per raceme

Actual number, as an average of one raceme from each of 10 plants at pod filling period

If determinate type, one terminal raceme;
If indeterminate type, one lateral raceme

6.2.6 Raceme length

In cm, as an average of one raceme from each of 10 plants at pod filling period

If determinate type, one terminal raceme;
If indeterminate type, one lateral raceme

6.2.7 Raceme position

- 1 Upright
- 2 Horizontal
- 3 Other (specify in the NOTES descriptor, 11)

6.2.8 Calyx/bracteole colour

Freshly opened flower

- 1 Green
- 2 Coloured (anthocyanin)

6.2.9 Hairiness of bracteole

- 0 Absent (glabrous)
- 3 Low
- 5 Intermediate
- 7 High

6.2.10 Colour of flower keel

- 1 Pure white
- 2 White with pink nervation
- 3 Pink
- 4 Orange
- 5 Scarlet
- 6 Violet
- 7 Purple
- 8 Mixed

6.2.11 Hairiness of standard

- 0 Absent
- + Present (sparsely hairy on the tip)

6.2.12 Colour of flower standard

- 1 Pure white
- 2 White with pink nervation
- 3 Pink
- 4 Orange
- 5 Scarlet
- 6 Violet
- 7 Purple
- 8 Mixed

6.2.13 Wing opening

Freshly opened flowers. See Figure 9

- 0 Parallel closed
- 3 Intermediate opening
- 7 Widely diverging

<<I>> p22.gif Figure 9. Wing opening

6.2.14 Pod pubescence

- 0 Glabrous
- 3 Glabrescent
- 5 Pubescent at young stage
- 7 Pubescent to maturity

6.2.15 Pod curvature

Of fully expanded immature pod. See Figure 10

- 0 Straight
- 3 Slightly curved
- 7 Markedly curved

<<I>> p23a.gif Figure 10. Pod curvature

6.2.16 Pod beak shape

On fully expanded immature pods. See Figure 11

- 1 Short beak
- 2 Medium length beak
- 3 Long beak

<<I>> p23b.gif Figure 11. Pod beak shape

6.2.17 Pod beak position

See Figure 12

- 1 Marginal
- 2 Non-marginal

<<I>> p24.gif Figure 12. Pod beak position

6.2.18 Position of pod bearing racemes

- 1 Mainly concentrated at the base
- 2 Mainly concentrated in the middle
- 3 Mainly concentrated at the top
- 4 Evenly distributed throughout the plant
- 5 Variably distributed

6.2.19 Pod background colour

On mature pod

- 1 Greenish
- 2 Straw
- 3 Brown
- 4 Other (specify in the NOTES descriptor, 11)

6.2.20 Pod suture string

- 0 Absent
- + Present

6.2.21 Pod width

In cm, of the widest width, average of randomly chosen mature pods

6.2.22 Pod constriction between seeds

- 0 None
- 3 Slight
- 5 Intermediate
- 7 Pronounced

6.2.23 Number of locules per pod

Ovule attachment, average of 20 randomly chosen full sized pods

6.2.24 Pod dehiscence

At maturity

- 0 Non-shattering
- + Shattering

6.3 SEED

6.3.1 Darker colour of seed coat pattern

Enter lighter colour under 4.3.4

- 0 Pattern absent or monocoloured
- 1 Brown
- 2 Red
- 3 Violet
- 4 Dark violet
- 5 Black

6.3.2 Brilliance of seed

- 3 Matt
- 5 Intermediate
- 7 Shiny

6.3.3 Apparent seed veining

- 0 Absent
- + Present

6.3.4 Seed length

In ram, average of 20 randomly chosen seeds

6.3.5 Seed width

In mm average of 20 randomly chosen seeds

6.3.6 Seed thickness

In mm average of 20 randomly chosen seeds

6.3.7 Number of developed seeds per pod

Actual number, average of 20 randomly chosen ripe pods

6.3.8 Splitting of seed testa

0 Absent
+ Present

6.3.9 Seed germination within pods

Radicle emergence

0 Absent
+ Present

6.3.10 Dry seed yield

In t/ha (= hectogrammes/sq. metre)

6.3.11 Seed weight

Weight of 100 seeds in mg at moisture content 12-14%

6.3.12 Seed volume

94% ethanol displaced by 100 seeds, in ml

6.3.13 Percentage seed protein

Actual percentage. Specify method in the NOTES descriptor, 11.

6.3.14 Percentage seed carbohydrate

Actual percentage. Specify method in the NOTES descriptor, 11.

6.3.15 Cooking time

In min; specify how long in storage and cooking method in the NOTES descriptor, 11.

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

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 1-9 scale, where

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

8.1 PESTS

8.1.1	<i>Acanthoscelides obtectus</i> (Say)	Bean seed beetle
8.1.2	<i>Aphis fabae</i> Scopoli	Black bean aphid
	<i>Aphis craccivora</i> Koch	Groundnut aphid
	<i>Aphis</i> spp.	
8.1.3	<i>Apion godmani</i>	Bean pod weevil
8.1.4	<i>Bemisia tabaci</i> (Genn.)	White fly
8.1.5	<i>Caliothrips braziliensis</i>	Thrips
8.1.6	<i>Callosobruchus maculatus</i> F.	Cowpea seed beetle
8.1.7	<i>Diabrotica</i> spp.	Leaf-feeding insects
8.1.8	<i>Empoasca fabae</i> Harris	Potato leafhopper
	<i>Empoasca kraemeri</i> Boss. & Moore	Leafhopper
	<i>Empoasca dolichi</i>	Leafhopper
8.1.9	<i>Epilachna varivestis</i> Mulsant	Mexican bean beetle
8.1.10	<i>Heliothis</i> spp.	Pod borer
8.1.11	<i>Hylemya</i> spp.	Seedcorn maggot
8.1.12	<i>Maruca testulalis</i> (Ger.)	Pod borer
8.1.13	<i>Ophiomyia phaseoli</i> (Tryon)	Beanfly
	or <i>Melanogromyza phaseoli</i> Tryon	
8.1.14	<i>Zabrotes subfasciatus</i> Boheman	Bean seed beetle
8.1.15	<i>Polyphagotrosonomis latis</i>	Tarsonomid mites
8.1.16	<i>Tetranychus</i> spp.	Spider mites
8.1.17	<i>Meloidogyne</i> spp.	Root knot nematode
8.1.18	<i>Pratylenchus</i> spp.	Root lesion nematode
8.1.19	Other pests (specify in the NOTES descriptor, 11)	

8.2 FUNGI

8.2.1	<i>Alternaria</i> spp.	Alternaria leaf and pod spot
8.2.2	<i>Ascochyta phaseolorum</i> Sacc.	Ascochyta leaf spot
	<i>Ascochyta</i> spp. (other species)	
8.2.3	<i>Botrytis cinerea</i> Per. ex Fr.	Grey mould
8.2.4	<i>Cercospora canescens</i> Ellis & Martin	Cercospora leaf spot
	<i>Cercospora</i> spp. (other species)	

8.2.5	<i>Colletotrichum lindemuthianum</i> (Sacc. & Magn.) Bri. & Cav.	Anthracnose
8.2.6	<i>Diaporthe</i> spp.	Pod blight
8.2.7	<i>Elsinoe phaseoli</i> Jenkins	Scab
8.2.8	<i>Erysiphe polygoni</i> DC ex Merat.	Powdery mildew
8.2.9	<i>Fusarium solani</i> (Mart.) Appel and Wollenw. <i>Fusarium</i> spp. (other species)	Fusarium root rot
8.2.10	<i>Isariopsis laxa</i> (Ell.) Scacc.	
8.2.11	<i>Macrophomina phaseolina</i> (Maubl.) Ashby	Ashy stem blight
8.2.12	<i>Nematospora coryli</i> Pegl.	Yeast spot
8.2.13	<i>Phakopsora</i> spp.	Pink rust (soyabean rust)
8.2.14	<i>Phoebesariopsis griseola</i> (Ferraris)	Angular leaf spot
8.2.15	<i>Phytophthora phaseoli</i> Thaxter <i>Phytophthora</i> spp. (other species)	Downy mildew
8.2.16	<i>Pseudocercospora albida</i> (Matta and Balliard)	White leaf spot
8.2.17	<i>Pythium ultimum</i> Trow. <i>Pythium aphanidermatum</i> (Edison) Fritz	Seedling wilt
8.2.18	<i>Rhizoctonia solani</i> Kuehn <i>Rhizoctonia</i> spp. (other species)	Web blight
8.2.19	<i>Sclerotinia sclerotiorum</i> (Lib.) de Bary	White mould
8.2.20	<i>Sclerotium rolfsii</i> Sacc.	Southern blight
8.2.21	<i>Thielaviopsis basicola</i> (Berk. and Br.) Ferr	Black root rot
8.2.22	<i>Uromyces phaseoli</i> (Pers.) Winter <i>Uromyces</i> spp. (other species)	Rust
8.2.23	Other fungi (specify in the NOTES descriptor, 11)	

8.3 BACTERIA

8.3.1	<i>Corynebacterium flaccumfaciens</i> (Hedges) Dowson	Bacterial wilt
8.3.2	<i>Pseudomonas phaseolicola</i> (Burk.) Dowson	Halo blight
8.3.3	<i>Pseudomonas syringae</i> Van Hall <i>Pseudomonas</i> spp. (other species)	Bacterial brown spot
8.3.4	<i>Xanthomonas phaseoli</i> (E.F. Smith) Dowson <i>Xanthomonas phaseoli</i> var. <i>fuscans</i> (Burk.) Starr & Burk. <i>Xanthomonas</i> spp. (other species)	Bacterial blight
8.3.5	Other bacteria	

8.4 VIRUS AND MYCOPLASM

8.4.1 Alfalfa mosaic virus

8.4.2 Bean chlorotic mottle viues

8.4.3 Bean common mosaic virus; systemic symptoms

8.4.4 Bean common mosaic virus; necrotic symptoms

8.4.5 Bean curly dwarf mosaic virus

8.4.6 Bean golden mosaic virus

8.4.7 Bean rugose mosaic virus

8.4.8 Bean southern mosaic virus

8.4.9 Bean summer death

8.4.10 Bean yellow mosaic virus

8.4.11 Bean yellow stipple virus

8.4.12 Cucumber mosaic virus

8.4.13 Curly top virus

8.4.14 Euphorbia mosaic virus

8.4.15 Red node (tobacco streak virus)

8.4.16 Rhynchosia mosaic virus

8.4.17 Tomato spotted wilt virus

8.4.18 Other viruses (specify in the NOTES descriptor, 11)

8.4.19 Mycoplasmas (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, 4.3.2, etc. Also include here any further relevant information such as flowering response to photoperiodic conditions.

APPENDIX: WORLD EXPERTS WHO PROVIDED INPUT FOR THIS DESCRIPTOR LIST

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