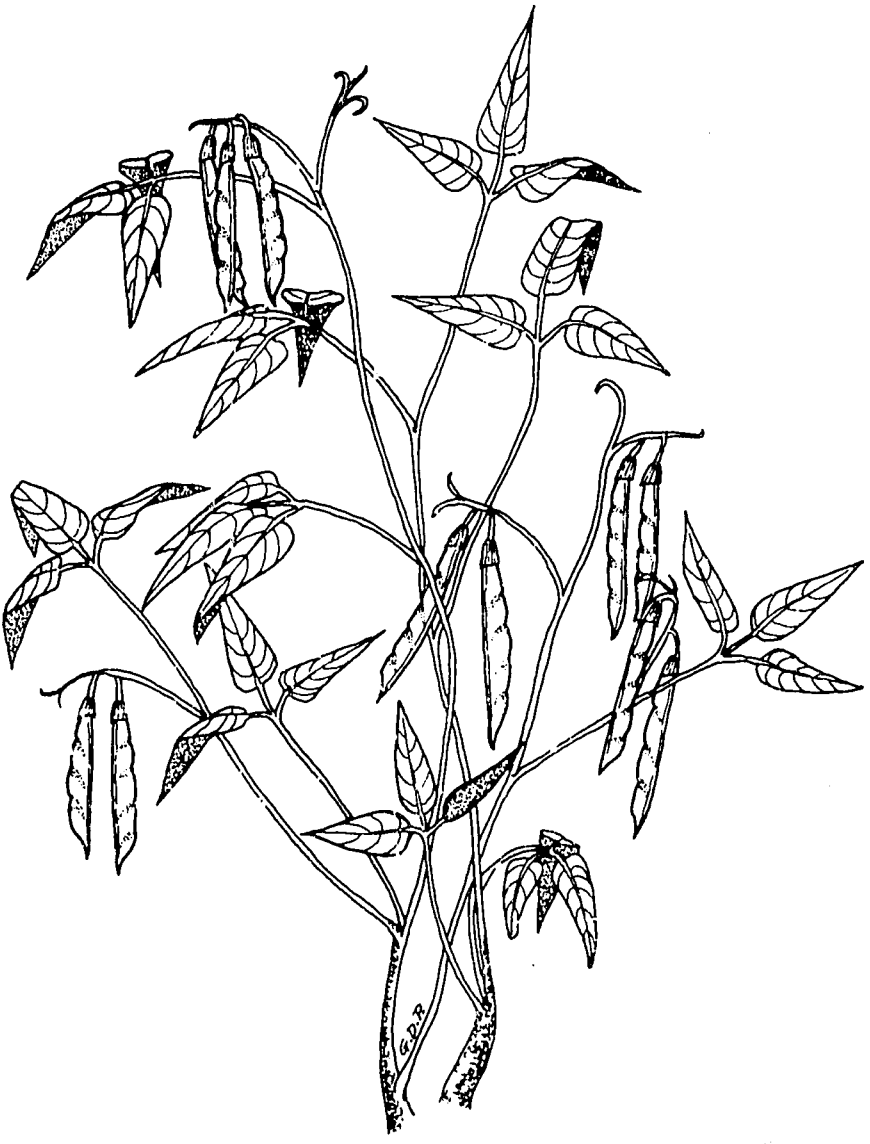

PHASEOLUS ACUTIFOLIUS

DESCRIPTORS

93600 ...
PN-AAV-62
ISN 46991

AGPG:IBPGR/85/31
March 1985

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

PHASEOLUS ACUTIFOLIUS DESCRIPTORS

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.

IBPGR Executive Secretariat
Crop Genetic Resources Centre
Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla, 00100 Rome, Italy

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PREFACE

Phaseolus acutifolius (tepary bean) is a strictly annual species that was domesticated more than 5,000 years ago in Mexico. In its natural habitat it is self-pollinated with a small amount of out-pollination. *P. acutifolius* has long been used as a dry bean for human food and as livestock forage in Mexico, adjacent southwestern USA and Central America, where both wild and domesticated forms are native. It can be crossed with difficulty to *P. coccineus* and *P. vulgaris*. It is not closely related to these domesticates, nor to *P. lunatus*. Although best known as an arid land crop, germplasm from the wet tropics also exists.

This descriptor list has been prepared in an IBPGR standard format following advice on descriptors and descriptor states from 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 by any user.

Although the suggested coding should not be regarded as a 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 ACUTIFOLIUS

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 considered 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.

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 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. 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 upgraded colour characters (the precise chart used should be specified in NOTES descriptor, 11).

PASSPORT

1. ACCESSION DATA

1.1 ACCESSION NUMBER

This number serves as a unique identifier for each accession 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 the 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 collector's 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 Variety

(see Note on following page)

Note: Three distinct subspecific taxa can be recognized:

1) var. acutifolius (wild): characterized by its linear, lanceolate or subhastate lobed leaflets; smallest seeds with delayed germination

2) var. latifolius (wild): characterized by its ovate lanceolate to broadly ovate leaflets; slightly larger seeds with delayed germination

3) var. latifolius (domesticate): characterized by its ovate lanceolate to ovate leaflets; much larger seeds; more immediate germination

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 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

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 WAS 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 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 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? If so, provide any identification in NOTES descriptor, 11

0 No
+ Yes

2.15 RAINFALL AT COLLECTION SITE

Average annual rainfall in millimetres

2.16 TEMPERATURE AT COLLECTION SITE

2.16.1 Minimum temperature

Average annual minimum temperature in degrees C

2.16.2 Maximum temperature

Average annual maximum temperature in degrees C

2.17 TOPOGRAPHY

1 Wetlands/swamp
2 Flood plain
3 Level plains
4 Undulating
5 Hilly
6 Mountainside
7 Canyon
8 Other (specify in NOTES descriptor, 11)

2.18 TYPE OF MATERIAL

1 Pure line (single plants or morphologically homogenous populations)
2 Presence of other lines or species given separate accession status (list accession numbers in NOTES descriptor, 11)
3 Segregating

2.19 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

2.20 HERBARIUM SPECIMEN

Was a herbarium specimen collected?

0 No
+ Yes

2.21 PRESENCE OF RHIZOBIA NODULES ON ROOTS

0 None
3 Light
5 Intermediate
7 Heavy

2.22 RHIZOBIA NODULES COLLECTED

Were *Rhizobia* nodules collected in silica gel for storage and later evaluation?

0 No
+ Yes

2.23 LOCAL USES

Uses given to seed, pods or foliage by local farmers

2.24 OTHER NOTES FROM COLLECTOR

Collectors will record ecological information. Presence of strongly-associated plants, unusual soils or environmental stresses will be recorded for both wild and domesticated beans. For cultivated crops, cultivation practices such as irrigation, intercropping, season of sowing, etc. will be recorded

CHARACTERIZATION AND PRELIMINARY EVALUATION

3. SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE AND ITS LOCATION)

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 DATA

Day of final harvest of mature pods

3.5.1 Day

3.5.2 Month

3.5.3 Year

3.6 CULTIVATION METHOD

Indicate row spacing, number of plants per square meter, irrigation, or other management practices

4. PLANT DATA

For all of the following characters, describe the mean character first; then refer to variants and their percentage of the entire population in NOTES descriptor, 11

4.1 VEGETATIVE

4.1.1 Leaflet shape

Measured on the terminal leaflet of the third trifoliate leaf, to obtain a ratio between the length (l) and width (w). Treat shallowly lobed leaflets as a separate category. See Figure 1, below

1 Ovate (l/w 1.0 to 1.5)
2 Ovate-lanceolate (l/w 1.5 to 2.0)
3 Lanceolate (l/w 2.0 to 3.0)
4 Linear-lanceolate (l/w 3.0 to 6.0)
5 Linear (l/w greater than 6)
6 Shallowly lobed
7 Other (specify in NOTES descriptor, 11)

4.1.2 Plant type

1 Determinate bush
2 Indeterminate bush with erect branches
3 Indeterminate with prostrate branches
4 Indeterminate with semiclimbing main stem and branches
5 Indeterminate with moderate climbing ability and pods distributed evenly up the plant

./.

6 Indeterminate with aggressive climbing ability and pods mainly on upper nodes of the plant
7 Other (specify in NOTES descriptor, 11)

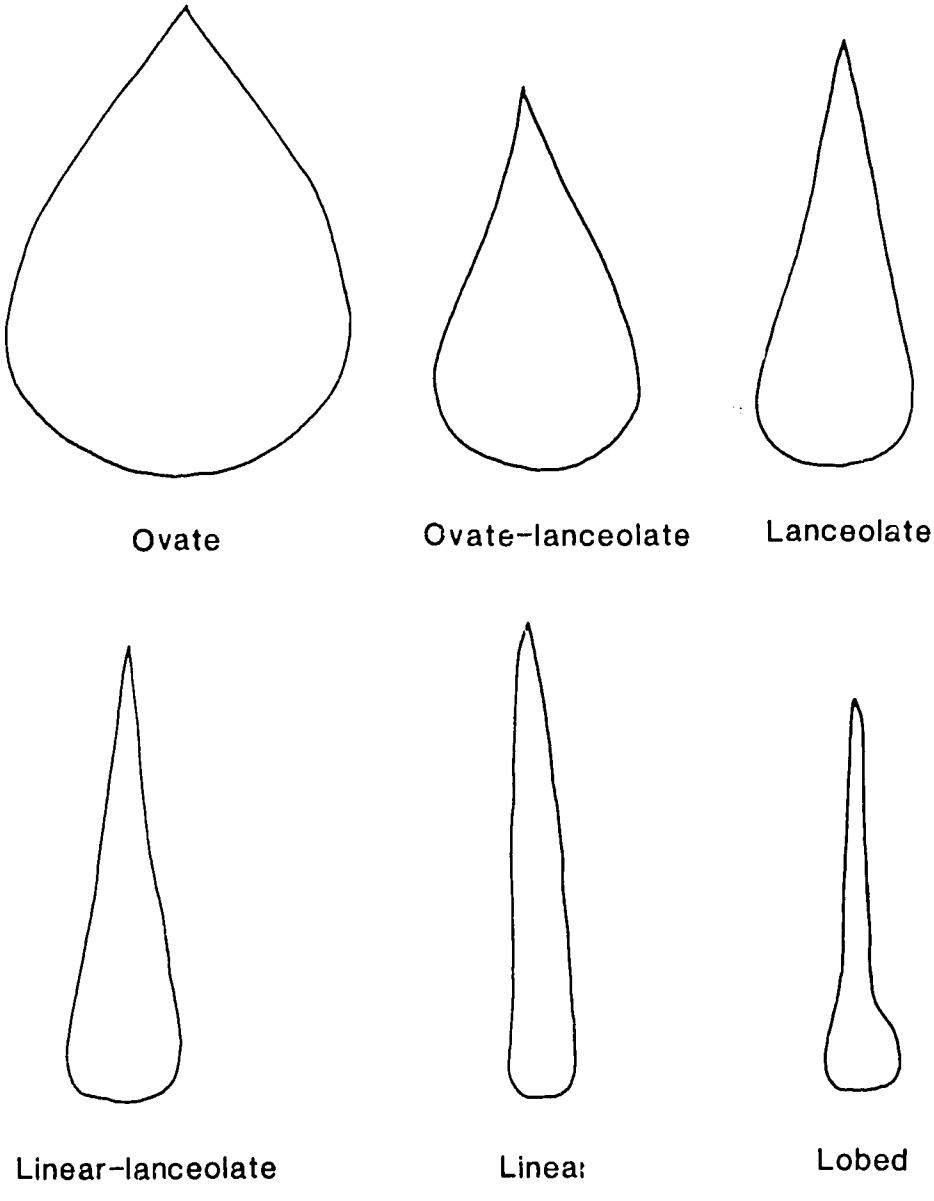

Figure 1. Leaflet shape

4.2 INFLORESCENCE AND FRUIT

4.2.1 Corolla colour

Wings and standard: recorded at full blossom at about 8.00 - 10.00 h

1 White
2 Pink
3 Lilac
4 Other (specify in NOTES descriptor, 11)

4.2.2 Mature pod colour

1 Yellow
2 Tan
3 Dull green
4 Other (specify in NOTES descriptor, 11)

4.2.3 Pod curvature

of fully expanded immature pod (Figure 2)

3 Straight
5 Slightly curved
7 Curved
9 Recurving

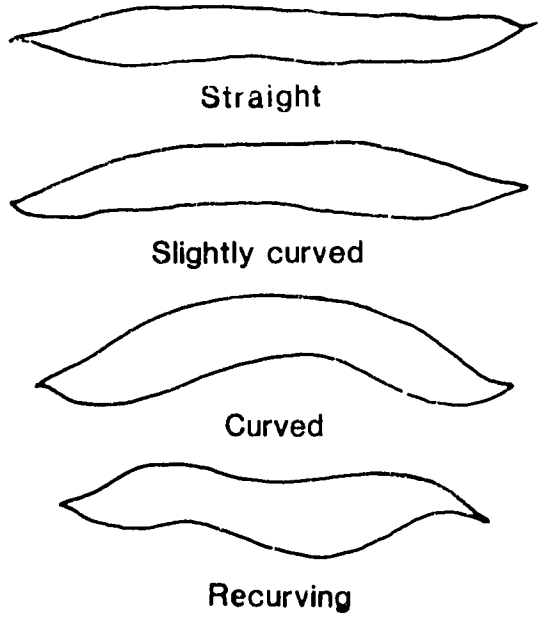

Figure 2. Pod curvature

4.2.4 Pod dehiscence and shattering

For the majority of 20 randomly sampled pods at dry maturity (Figure 3)

3 Leathery podded; no dehiscence (pods will not spontaneously open)
5 Minor shattering; weakly, tardily dehiscent (pods will slightly open along suture, but will not twist)
7 Excessive shattering; explosive dehiscence (pods will suddenly twist open, ejecting seeds)

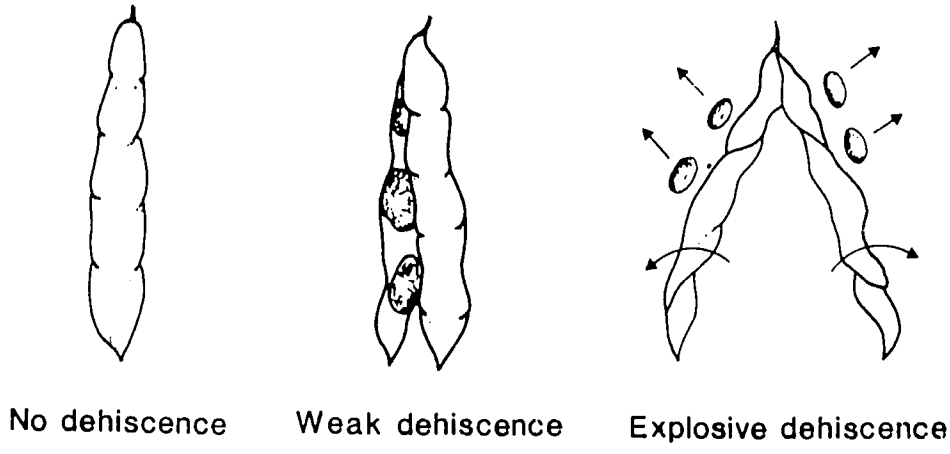

Figure 3. Pod dehiscence

4.2.5 Ovules per pod

Number of ovules from longest pod of 10 random normal plants

4.3 SEED

4.3.1 Seed colour

If mottled, the dark background colour; use Munsell colour chart (or specify other chart in NOTES descriptor, 11)

1 White
2 Pink
3 Light yellow
4 Dark yellow to orange

5 Cream to tan
6 Brown to red-brown
7 Black
8 Other (specify in NOTES descriptor, 11)

4.3.2 Seed coat pattern (mottle)

0 Mottle absent
+ Mottle present

4.3.3 Seed pattern colour

Colour of mottle

0 mottle absent
1 White
2 Ash grey
3 Tan
4 Brown
5 Yellow
6 Purple
7 Black
8 Other (specify in NOTES descriptor, 11)

4.3.4 Lustre on seed surface

0 Absent (dull)
+ Present (shiny)

4.3.5 Seed shape

Taken from middle of pod (Figure 4)

1 Flattened oval
2 Round oval
3 Flattened cuboid
4 Round cuboid
5 Flattened truncate
6 Round truncate
7 Other (specify and draw in NOTES, descriptor, 11)

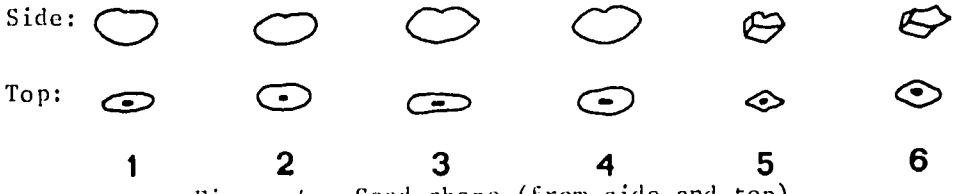

Figure 4. Seed shape (from side and top)

4.3.6 Seed length

Mean of 10 randomly chosen, ripe seeds

3	Short	(3.6 - 5.6 mm)
5	Medium	(7.6 - 8.5 mm)
7	Long	(9.6 - 10.5 mm)

4.3.7 Seed thickness

Mean of 10 randomly chosen, ripe seeds

3	Thin	(2.6 - 3.0 mm)
5	Medium	(3.6 - 4.0 mm)
7	Thick	(4.6 - 5.0 mm)

4.3.8 Number of seeds per pod

Mean of 20 randomly chosen pods from same plant

3	Few	(2-3 seeds)
5	Intermediate	(6-7 seeds)
7	Many	(10-11 seeds)

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY OF FURTHER CHARACTERIZATION AND EVALUATION

5.2 SITE (RESEARCH INSTITUTE AND LOCATION)

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 FIRST HARVEST DATE

5.5.1 Day

5.5.2 Month

5.5.3 Year

5.6 LAST HARVEST DATE

5.6.1 Day

5.6.2 Month

5.6.3 Year

5.7 CULTIVATION METHOD

Indicate row spacing and number of plants per square meter, irrigation or other management practices

6. PLANT DATA

6.1 VEGETATIVE

6.1.1 Days to emergence

From sowing to stage when 50% of seedlings have emerged

6.1.2 Seedling vigour

Assessed 20 days after emergence

3 Poor vigour
5 Medium
7 Vigorous

6.1.3 Hypocotyl colour

Recorded 10 days after emergence

1 Green
2 Purple
3 Other (specify in NOTES descriptor, 11)

6.1.4 Terminal leaflet length

Recorded for terminal leaflet of third trifoliate leaf, from pulvinus to leaf tip

3 Short (3-4 cm)
5 Medium (7-8 cm)
7 Long (11-12 cm)

6.1.5 Terminal leaflet width

Recorded for terminal leaflet of third trifoliate leaf

3 Narrow (2.3 - 2.7 cm)
5 Medium (3.3 - 3.7 cm)
7 Wide (4.3 - 4.7 cm)

6.1.6 Lateral leaflet length

Recorded for lateral leaflet of third trifoliate leaf

3 Short (2.6 - 3.5 cm)
5 Medium (4.6 - 5.5 cm)
7 Long (6.6 - 7.5 cm)

6.1.7 Lateral leaflet width

Recorded for lateral leaflet of third trifoliate leaf

3 Narrow (1.1 - 2.0 cm)
5 Medium (3.1 - 4.0 cm)
7 Wide (5.1 - 6.0 cm)

6.1.8 Leaf anthocyanin

0 Absent
+ Present

6.1.9 Leaf colour: intensity of green colour

4-6 weeks after sowing

3 Pale green
5 Medium green
7 Dark green

6.1.10 Colour of basal petioles

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

6.1.11 Petiole length of terminal leaflet

Recorded for terminal leaflet of third trifoliate leaf

3 Short (1.3 - 1.7 cm)
5 Medium (2.3 - 2.7 cm)
7 Long (3.3 - 3.7 cm)

6.1.12 Leafiness

When 50% of plants have begun to flower

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

6.1.13 Photoperiod response

1 Qualitative short day (14 hours or less needed)
2 Quantitative short day (14 hours or less, unless broken by repeated cycles of 16 to 18 hours)
3 Day neutral
4 Long day

6.1.14 Length of branch

Measure the longest branch in centimetres; record when first pod changes colour

6.1.15 Plant height

In centimetres on drawn-out plants; mean of 10 plants

6.1.16 Lodging

0 None
3 Light
5 Intermediate
7 Heavy

6.1.17 Root nodulation

0 None
3 Light (poor)
5 Intermediate
7 Heavy (good)

6.1.18 Whole plant yield

Mean weight in grams of 10 plants cut at ground level after drying in the sun, recorded as whole number

6.2 INFLORESCENCE AND FRUIT

6.2.1 Calyx colour

1 Green
2 Greenish purple
3 Other (specify in NOTES descriptor, 11)

6.2.2 Number of flowers per raceme

Mean of 10 plants

6.2.3 Days to flowering

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

6.2.4 Flowering period

3 Asynchronous
5 Intermediate
7 Synchronous

6.2.5 Stigma shape

1 Introrse
2 Terminal
3 Extrorse

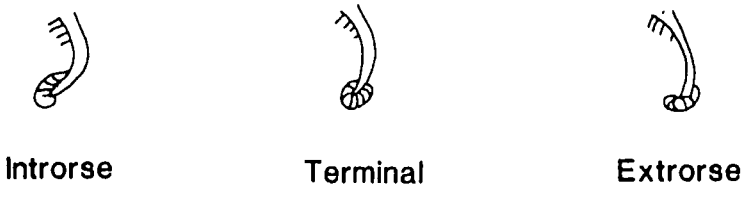

Figure 5. Stigma shape

6.2.6 Colour of ventral pod suture

Of immature pod

1 Green
2 Purple
3 Other (specify in NOTES descriptor, 11)

6.2.7 Pod width

Mean of 20 randomly chosen, fully expanded pods from same plant

3 Narrow (6.6 - 7.5 mm)
5 Medium (8.6 - 9.5 mm)
7 Wide (10.6 - 11.5 mm)

6.2.8 Pod pubescence

Recorded 3 weeks after flowering

0 Glabrous
3 Slightly pubescent
5 Intermediate
7 Heavily pubescent

6.2.9 Pod dehiscence

Of mature pods

3 Indehiscent
5 Tardily dehiscent
7 Explosively dehiscent

6.2.10 Shattering in the field

0 Absent
+ Present

6.2.11 Number of pod-bearing racemes

Count number of racemes having at least one fully grown pod at first harvest including both main stem and branches

6.2.12 Pods per plant

Mean number (recorded as whole number) of pods from 10 randomly chosen plants

6.2.13 Days to first mature pods

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

6.3 SEED

6.3.1 Hilum

1 Non-concave
2 Concave

6.3.2 First harvest yield

Percentage seed yield of first harvest over the total harvest

6.3.3 Seed weight

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

6.3.4 Seed volume

Volume, in millimetres, of ethanol at 94% strength that is displaced by 100 seeds

6.3.5 Seed dimensions

Average, in millimetres, of 10 seeds, each from a different plant

6.3.5.1 Length (measured parallel to the hilum)

6.3.5.2 Width (measured at hilum mid-section)

6.3.5.3 Height (measured from hilum to opposite side)

6.3.6 Percentage seed protein

Crude Kjeldahl nitrogen content, multiplied by a 6.25 conversion factor

7. STRESS SUSCEPTIBILITY

These reactions are coded on a 1-9 scale:

3 Low susceptibility
5 Medium susceptibility
7 High susceptibility

in comparison to a designated control recorded in NOTES descriptor, 11. (Previously published controls compared to tepary beans include *P. vulgaris* green bean cv. Harvester, or dry bean cv. Pinto UI 114.)

7.1 LOW TEMPERATURE

7.1.1 Low temperatures during germination

Susceptibility to night soil temperatures below 15°C

7.1.2 Low temperatures during flowering and fruiting

Susceptibility to night soil temperatures below 10°C

7.2 HIGH TEMPERATURE

7.2.1 High temperatures during germination

Susceptibility to daytime soil temperatures above 40°C

7.2.2 High temperatures during flowering and fruiting

Susceptibility to daytime soil temperatures above 35°C

7.3 DROUGHT

7.3.1 Drought susceptibility

Drought susceptibility in comparison to control (defined by days without watering or soil water potential drops recorded in NOTES descriptor,11).

7.3.2 Seedling stage drought endurance

Percentage of seedlings surviving after 14 days of no rain or irrigation following a preplanting irrigation

7.3.3 Flowering stage drought tolerance

Percentage of plants surviving after 21 days of no rain or irrigation following an irrigation to field capacity (record soil texture in NOTES descriptor,11)

7.3.4 Dehydration postponement

Note rooting depths of accession and control in NOTES descriptor,11

7.4 SALINITY

7.4.1 Soil salinity susceptibility

Susceptibility in comparison to control (record parts per million of soluble salts in top 15 cm of soil, and symptoms in NOTES descriptor,11)

7.4.2 Water salinity susceptibility

Susceptibility in comparison to control (record parts per million soluble salts of soil water in root zone, and symptoms in NOTES descriptor,11)

7.5 ALKALINITY

7.5.1 Soil alkalinity (or acidity) susceptibility

Susceptibility in comparison to control (record pH of top 15 cm of soil, and symptoms in NOTES descriptor,11)

7.6 MINERAL TOLERANCE

7.6.1 Mineral level susceptibility

Susceptibility or tolerance to high or low levels of selected minerals (boron, aluminium, etc.) in comparison to control (record the mineral, its availability in the soil in parts per million, and resulting symptoms, if any, in NOTES descriptor, 11)

7.7. DAY LENGTH

Record limitations to flowering due to day length in NOTES, descriptor,11

7.8 SOURCE AND NATURE OF STRESS SUSCEPTIBILITY INFORMATION

1 No information
2 Information from field collector's notes from original location
3 Information from preliminary evaluation nursery or first grow-out of accession without intentional stress tests
4 Information from field tests where stress conditions were imposed
5 Information from growth chamber green-house or laboratory tests where stress conditions were imposed
6 Other (specify in NOTES descriptor,11)

8. PEST AND DISEASE SUSCEPTIBILITY

8.1 PESTS

		Vernacular name
8.1.1	Acanthoscelides obtectus	Bean seed beetle
8.1.2	Agrostis ipsilon	Cutworm
8.1.3	Aphis spp.	Aphids
8.1.4	Bemisia tabaci	Whitefuly
8.1.5	Caliothrips spp.	Thrips
8.1.6	Empoasca spp.	Leafhoppers
8.1.7	Heliothis spp.	Pod borers
8.1.8	Heterodera glycines Heterodera marioni	Cyst nematodes
8.1.9	Lygus spp.	Bug
8.1.10	Maruca testulalis	Pod borers
8.1.11	Meloidogyne spp.	Root knot nematodes
8.1.12	Ophiomyia phaseoli	Beanfly
8.1.13	Rotylenchulus reniformis	Reniform nematod
8.1.14	Tetranychus spp.	Spider mite
8.1.15	Tylenchorynchus dubius	Nematode
8.1.16	Zabrotes subfasciatus	Bruchid beetles
8.1.17	Others (specify in the NOTES descriptor, 11)	

8.2 FUNGI

8.2.1	Alternaria spp.	Alternaria leaf or pod spot
8.2.2	Ascochyta spp.	Ascochyta leaf spot
8.2.3	Botrytis cinerea	Gray mould
8.2.4	Cercospora spp.	Cercospora leaf spot

8.2.5	Colletotrichum lindemuthianum	Anthracnose
8.2.6	Diaporthe spp.	Pod blight
8.2.7	Elsinoe phaseoli	Scab
8.2.8	Erysiphe polygoni	Powdery mildew
8.2.9	Fusarium solani	Fusarium root rot
	Fusarium spp.	
8.2.10	Macrophomina phaseoli	Collar rot, ashystem blight
8.2.11	Nematosphora coryli	Yeast spot
	Nematosphora sp.	
8.2.12	Pythium spp.	Root rot, damping off
8.2.13	Rhizoctonia solani	Web blight
	Rhizoctonia spp.	Root rot
8.2.14	Sclerotinia sclerotiorum	White mould
8.2.15	Sclerotium rolfsii	Southern blight
8.2.16	Thielaviopsis basicola	Black root rot
8.2.17	Uromyces appendiculatus	Rusts
	Uromyces phaseoli	
8.2.18	Others (specify in the NOTES descriptor, 11)	

8.3 BACTERIA

8.3.1	Corynebacterium flaccumfaciens	Bacterial wilt
8.3.2	Pseudomonas phaseolicola	Halo blight
8.3.3	Pseudomonas syringae	Bacterial brown spot
8.3.4	Xanthomonas phaseoli	Bean common blight
8.3.5	Others and specific strains of the above (specify in NOTES descriptor, 11)	

8.4 VIRUS AND MYCOPLASM

8.4.1 Alfalfa mosaic

8.4.2 Alsike clover mosaic

8.4.3 Bean chlorotic ringspot

8.4.4 Bean golden yellow mosaic

8.4.5 Bean local chlorosis

8.4.6 Bean mosaic

8.4.7 Bean necrosis

8.4.8 Cucumber mosaic

8.4.9 Curly top

8.4.10 Pod mottle

8.4.11 Tobacco ring spot

8.4.12 White clover mosaic

8.4.13 Yellow mottle

8.4.14 Yellow mosaic of mung

8.4.15 Other viruses (specify in NOTES descriptor, 11)

8.4.16 Mycoplasma (specify in NOTES descriptor, 11)

8.5 SOURCE AND NATURE OF PEST AND DISEASE INFORMATION

1 No information
2 Information from field collector's notes from original locality
3 Information from preliminary evaluation nursery or first grow-out of accession without intentional inoculation
4 Information from laboratory or field tests which were inoculated but not with defined strains or races
5 Information from tests made with defined inocula or races
6 Other (specify in NOTES descriptor, 11)

9. BIOCHEMICAL AND PHYSIOLOGICAL RESEARCH DATA

1 No information
2 Used in physiological research described in NOTES
3 Used in toxin or anti-nutrient research described in NOTES
4 Used in studies of major storage protein fraction analysis described in NOTES
5 Used in studies of iso-enzyme variation described in NOTES
6-8 To be defined later
9 Other

10. CYTOLOGICAL CHARACTERS AND OTHER IDENTIFIED GENES

Describe

11. NOTES

Give additional information where descriptor state is noted as 'Other' as, for example, 8.4.15. Also include here any other relevant information, such as reports or published articles which refer to this accession