CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

# PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

## *Phaseolus vulgaris* L.

## FRENCH BEAN

UPOV Code: PHASE_VUL

**Adopted on 01/04/2009**

**Entered into force on 12/03/2009**

## I - SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/12/9 dated 06/04/2005 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to varieties of ***Phaseolus vulgaris* L.**

## II - SUBMISSION OF SEED AND OTHER PLANT MATERIAL

1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of:

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the examination office to which material is to be sent.

A sub-sample of the material submitted for test will be held in the variety collection as the definitive sample of the candidate variety.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. Immediately after the closing date for the receipt of plant material the Examination Office should inform the CPVO whether acceptable plant material has been received or not. However if unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

3. Plant material requirements

The final dates for request for technical examination and sending of Technical Questionnaire as well as submission date of plant material by the applicant, and quantity of plant material to be supplied by the applicant are published on the CPVO website and in the S2 official gazette

Quality of seed: ..... Should not be less than the standards laid down for certified seed in Annex 2 of EC Directive 2002/55/EC.

Seed Treatment: ..... The plant material must not have undergone any treatment unless the CPVO and the examination office allow or request such treatment. If it has been treated, full details of the treatment must be given.

Special requirements: ..... -

Labelling of sample:..... - Species
- File number of the application allocated by the CPVO
- Breeder's reference
- Examination reference (if known)
- Name of applicant
- The phrase “On request of the CPVO”.
- In the case of a split sample, the quantity of seed being submitted

## III - CONDUCT OF TESTS

### 1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a variety collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

The composition of the variety collection in each Examination Office depends on the environmental conditions in which the Examination Office is located.

Variety collections will be held under conditions which ensure the long term maintenance of each accession. It is the responsibility of Examination Offices to replace reference material which has deteriorated or become depleted. Replacement material can only be introduced if appropriate tests confirm conformity with the existing reference material. If any difficulties arise for the replacement of reference material Examination Offices must inform the CPVO. If authentic plant material of a variety cannot be supplied to an Examination Office the variety will be removed from the variety collection.

### 2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties. Examination Offices should therefore make efforts to co-ordinate the work with other offices involved in DUS-testing of French bean. There should be at least an exchange of technical questionnaires for each candidate variety, and during the test period, Examination Offices should notify each other and the CPVO of candidate varieties which are likely to present problems in establishing distinctness. In order to solve particular problems Examination Offices may exchange plant material.

### 3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in Annex 1. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N° 1239/95, to insert additional characteristics and their expressions in respect of a variety.

4. Grouping of varieties

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping could be the following:

a) Plant: growth type (characteristic 2)

b) Flower: colour of standard (characteristic 15)

c) Pod: shape of cross-section (through seed) (characteristic 21)

d) Pod: ground colour (characteristic 22)

e) Pod: stringiness on ventral suture (characteristic 27)

f) Seed: number of colours (characteristic 41)

g) Seed: main colour (largest area) (characteristic 42)

h) Seed: predominant secondary colour (characteristic 43)

i) Resistance to Bean anthracnose (*Colletotrichum lindemuthianum*), Race Lambda (characteristic 47.1)

j) Resistance to Bean anthracnose (*Colletotrichum lindemuthianum*), Race 6 (characteristic 47.2)

k) Resistance to Bean Common Mosaic Virus (BMCV) (characteristic 48)

5. Trial designs and growing conditions

The minimum duration of tests will normally be two independent growing cycles. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows:

As a minimum each test should include a total of 150 plants for dwarf beans and 60 plants for climbing beans, divided between two replicates.

All observations determined by measurement or counting should be made on 20 plants or parts of 20 plants.

The time of observation:

(i) - leaf: all observation on the leaf should be made at the time of full flowering (all plants with flowers in bloom);
(ii) – pod: all observation on the pod should be made at the time of fresh market maturity;
(iii) – pod: observations on the secondary colour of the pod should be made at maturity;
(iv) – seed: all observations on the seed should be made on dry seed harvested from the plots.

6. Special tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.

7. Standards for decisions

a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation No. 2100/94.

b) **Uniformity**

For the assessment of uniformity a population standard of 1% for both dwarf beans and for climbing beans with an acceptance probability of at least 95% should be applied.

A candidate will be considered to be sufficiently uniform if the number of off-types does not exceed the number of plants as indicated in the table below.

Table of maximum numbers of off-types allowed for uniformity standards

| Number of plants | off-types allowed |
|---|---|
| 36-82 | 2 |
| 83-137 | 3 |
| 138-198 | 4 |

c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

## IV - REPORTING OF RESULTS

After each recording season the results will be summarised and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after two growing periods but in some cases three growing periods may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports by the date agreed between the CPVO and the examination office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

## V - LIAISON WITH THE APPLICANT

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report and final report shall be sent by the Examination Office to the CPVO.

## VI - ENTRY INTO FORCE

The present protocol enters into force on **12 March 2009**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the new TP. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for the submission of plant material for the first growing period.

In cases where the CPVO requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process of being carried out at the moment of the request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

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# ANNEXES TO FOLLOW

## ANNEX I

PAGE



Legend:

Note: For the CPVO numbered characteristics, all characteristics in the table are compulsory; notwithstanding, in the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory. The asterisks in the UPOV numbered characteristics are there for information purposes and denote those characteristics which should always be observed when a UPOV guideline is utilised.
In general for the assessment of resistance characteristics, the facilities of other Examination Offices or specialised institutions might be used, subject to previous arrangements.
Some characteristics may be discarded: if there are already phytosanitary restrictions.

C = climbing bean variety
D = dwarf bean variety
(+) See explanations on the table of characteristics
G Grouping characteristic

Types of expression of characteristics:

QL – Qualitative characteristic
QN – Quantitative characteristic
PQ – Pseudo-qualitative characteristic

Type of observation of characteristics:

MG – Single measurement of a group of plants or parts of plants
MS – Measurement of a number of individual plants or parts of plants
VG – Visual assessment by a single observation of a group of plants or parts of plants
VS – Visual assessment by observation of individual plants or parts of plants

When a method of observation is attributed to a certain characteristic, the first differentiation is made depending if the action taken is a visual observation (V) or a measurement (M).

The second differentiation deals with the number of observations the expert attributes to each variety, thus the attribution of either G or S.
If a single observation of a group consisting of an undefined number of individual plants is appropriate to assess the expression of a variety, we talk about a visual observation or a measurement made on a group of plants, thus we attribute the letter G (either VG or MG). If the expert makes more than one observation on that group of plants, the decisive part is that we have at the end only one data entry per variety which means that we have to deal with G (e.g. measurement of plant length on a plot – MG, visual observation of green colour of leaves on a plot – VG).
If it is necessary to observe a number of individual plants to assess the expression of a variety, we should attribute the letter S (thus either VS or MS). Single plant data entries are kept per variety for further calculations like the variety mean (e.g. measurement of length of ears – MS, visual observation of growth habit of single plants in grasses – VS). The number of individual plants to be observed in such cases is stated in section III.5.



## ANNEX II

# ANNEX I

## TABLE OF CHARACTERISTICS TO BE USED IN DUS-TEST AND PREPARATION OF DESCRIPTIONS

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **1.** | **1.** | **VG** | **Plant: anthocyanin colouration of hypocotyl** | | |
| **QL** | **QL** | | absent | Tuf (D) | 1 |
| | | | absent | Delinel (D), Vilbel (D) | 9 |
| **2.** | **3.** | **VG** | **Plant: growth type** | | |
| **QL** | **QL** | | dwarf | Callide (D), Capitole (D) | 1 |
| **G** | | | climbing | Phenomene (C), Bacle (C) | 2 |
| **3.** | **4.** | **VG** | **Climbing beans only: Plant: architecture** | | |
| **PQ** | **PQ** | | pyramidal | Haricot maïs | 1 |
| | | | rectangular | Hilda | 2 |
| **4.** | **5.** | **VG** | **Dwarf beans only: Plant: dwarf type** | | |
| **PQ** | **PQ** | | non-vining | Callide, Capitole | 1 |
| | | | vining | Great Northern, Felspar, Spinel | 2 |
| **5.** | **6.** | **MG/ MS/VG** | **Dwarf beans only: Plant: height** | | |
| **QN** | **QN** | | low | Goldfish | 3 |
| | | | medium | Fori | 5 |
| | | | high | Nerina, Rote von Paris | 7 |
| **6. (+)** | **7. (+)** | **MG/ MS/VG** | **Climbing beans only: Plant: start of climbing (80% of plants)** | | |
| **QN** | **QN** | | early | Perle von Marbach | 3 |
| | | | medium | Trebona | 5 |
| | | | late | Record | 7 |
| **7. (+)** | **8. (+)** | **VG** | **Climbing beans only: Plant: speed of climbing** | | |
| **QN** | **QN** | | slow | | 3 |
| | | | medium | Meicy | 5 |
| | | | rapid | Perle von Marbach | 7 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **8.** | **9.** | **VG** | **Leaf: intensity of green colour** | | |
| **QN** | **QN** | | very light | | 1 |
| | | | light | Rote von Paris (D), Goldelfe (C) | 3 |
| | | | medium | Fori (D), Valja (D) | 5 |
| | | | dark | Dubra (D), Goldfish (D), Silvia (C) | 7 |
| | | | very dark | Diva (D) | 9 |
| **9.** | **10.** | **VG** | **Leaf: rugosity** | | |
| **QN** | **QN** | | absent or very weak | IPR Gruana (C), IPR Uirapuru (C) | 1 |
| | | | weak | Goldfish (D), Groffy (D), Valja (D), Record (C) | 3 |
| | | | medium | Butterzart (D), Fillety (D), Fiori (D), Neckarkönigin (C) | 5 |
| | | | strong | Loma (D) | 7 |
| | | | very strong | Brede Z.dr (D) | 9 |
| **10.** | **11.** | **VG** | **Terminal leaflet: size** | | |
| **QN** | **QN** | | small | Goldfish (D) | 3 |
| | | | medium | Prelude (D) | 5 |
| | | | large | Facta (D), Longking (D), Rote von Paris (D) | 7 |
| **11.** | **12.** | **VG** | **Terminal leaflet: shape** | | |
| **(+)** | **(+)** | | triangular | Aber (D), Candide (D) | 1 |
| **PQ** | **PQ** | | triangular to circular | Facta (D) | 2 |
| | | | circular | Acarli (D), Felix (D), Niver (D) | 3 |
| | | | circular to quadrangular | Calas (D), Capitole (D), Dorabel (D) | 4 |
| | | | quadrangular | Ace (D), Carlyn (D), Madrigal (D) | 5 |
| **12.** **(+)** | **13.** **(+)** | **VG** | **Terminal leaflet: apex** | | |
| **QN** | **QN** | | short acuminate | | 3 |
| | | | medium acuminate | Goldfish (D), Tuf (D) | 5 |
| | | | long acuminate | Flo (D), Nerina (D), Prelude (D) | 7 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **13.** | **14.** | **VG** | **<u>Dwarf beans only</u>: Inflorescences: location (at full flowering)** | | |
| **QN** | **QN** | | in foliage | Ryco | 1 |
| | | | partly in foliage | Valja, Tuf | 2 |
| | | | above foliage | Daisy, Goldetta | 3 |
| **14.** | **15.** | **VG** | **Flower: size of bract** | | |
| **QN** | **QN** | | small | Fanion (D), Nerina (D), Ryco (D), Fidel (C), Markant (C) | 3 |
| | | | medium | Torrina (D), Meicy (C) | 5 |
| | | | large | Label (D), Pfälzer Juni (D), Toplong (C) | 7 |
| **15.** | **16.** | **VG** | **Flower: colour of standard** | | |
| **PQ** | **PQ** | | white | Tuf (D) | 1 |
| | | | pinkish white | | 2 |
| | | | pink | Maxi (D), Vilbel (D) | 3 |
| **G** | | | violet | Delinel (D), Purple Teepee (D) | 4 |
| **16.** | **17.** | **VG** | **Flower: colour of wing** | | |
| **PQ** | **PQ** | | white | Tuf (D) | 1 |
| | | | pinkish white | Signal (D) | 2 |
| | | | pink | Maxi (D), Vilbel (D) | 3 |
| | | | violet | Delinel (D), Purple Teepee (D) | 4 |
| **17.1** | **18.** | **MS** | **<u>Dwarf beans only</u>: Pod: length (excluding beak)** | | |
| **QN** | **QN** | | very short | | 1 |
| | | | short | Prelude, Tuf | 3 |
| | | | medium | Amity, Lusia | 5 |
| | | | long | Dubra, Loma | 7 |
| | | | very long | Daisy, Longking, Maja | 9 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **17.2** | **19.** | **MS** | **<u>Climbing beans only</u>: Pod: length (excluding beak)** | | |
| **QN** | **QN** | | very short | | 1 |
| | | | short | Juwagold | 3 |
| | | | medium | | 5 |
| | | | long | Fidel | 7 |
| | | | very long | Toplong | 9 |
| **18. (+)** | **20. (+)** | **MS** | **Pod: width at maximum point** | | |
| **QN** | **QN** | | narrow | Cabri (D), Tuf, (D) Necores (C) | 3 |
| | | | medium | Regulex (D), Meicy (C) | 5 |
| | | | broad | Pfälzer Juni (D), Perle von Marbach (C) | 7 |
| **19. (+)** | **21. (+)** | **MS/VG** | **Pod: transversal width** | | |
| **QN** | **QN** | | very narrow | Booster (D) | 1 |
| | | | narrow | Bergamo (D), Rentegevers (C) | 3 |
| | | | medium | Impact (D), Flagrano (D), Donna (C) | 5 |
| | | | broad | Maxidor (D), Mondiam (D), Emerite (C) | 7 |
| | | | very broad | Kerprim (D), Neckarkönigin (C) | 9 |
| **20. (+)** | **23.** | **MS/VG** | **Pod: ratio transversal width/width at maximum point** | | |
| **QN** | **QN** | | small | Pascal (D), Pfälzer Juni (D), Regulex (D) | 3 |
| | | | medium | Tuf (D) | 5 |
| | | | large | Tendercrop White Seeded (D) | 7 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **21. (+)** | **22. (+)** | **VG** | **Pod: shape of cross section (through seed)** | | |
| **PQ** | **PQ** | | narrow elliptic | | 1 |
| | | | elliptic to ovate | Pascal (D), Pfälzer Juni (D), Regulex (D) | 2 |
| | | | cordate | Daisy (D) | 3 |
| | | | circular | Tuf (D) | 4 |
| **G** | | | eight shaped | Tendercrop White Seeded (D) | 5 |
| **22. (+)** | **24. (+)** | **VG** | **Pod: ground colour** | | |
| **QL** | **QL** | | yellow | Goldfish (D), Golddukat (D), Goldmarie (C) | 1 |
| | | | green | Diva (D), Filetty (D), Fortissima (C) | 2 |
| **G** | | | violet | Purpiat (D), Purple Teepee (D) | 3 |
| **23. (+)** | **25. (+)** | **VG** | **Pod: intensity of ground colour** | | |
| **QN** | **QN** | | light | Erato (D), Fortissima (C) | 3 |
| | | | medium | Gabriella (D), Filetty (D), Prelude (D) | 5 |
| | | | dark | Decibel (D), Golddukat (D), Purpiat (D) | 7 |
| **24.** | **26.** | **VG** | **Pod: secondary colour** | | |
| **QL** | **QL** | | absent | Tuf (D) | 1 |
| | | | present | Marbel (D) | 9 |
| **25.** | **27.** | **VG** | **Pod: hue of secondary colour** | | |
| **QL** | **QL** | | pink | IPR Juriti (C) | 1 |
| | | | red | Borlotto lingua di fuoco 2 (C) | 2 |
| | | | violet | Marbel (D) | 3 |
| **26.** | **28.** | **VG** | **Pod: density of flecks of secondary colour** | | |
| **QN** | **QN** | | sparse | | 3 |
| | | | medium | | 5 |
| | | | dense | | 7 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **27. (+)** | **29. (+)** | **VG** | **Pod: stringiness on ventral suture** | | |
| **QL** | **QL** | | absent | Cabri (D), Tuf (D) | 1 |
| **G** | | | present | Facta (D), Marbel (D) | 9 |
| **28.** | **30.** | **VG** | **Pod: degree of curvature** | | |
| **(+)** | **(+)** | | absent or very weak | | 1 |
| **QN** | **QN** | | weak | Nerina (D) | 3 |
| | | | medium | | 5 |
| | | | strong | Goldfish (D), Groffy (D), Ryco (D) | 7 |
| | | | very strong | | 9 |
| **29.** | **31.** | **VG** | **Pod: shape of curvature** | | |
| **(+)** | **(+)** | | concave | Admires (D) | 1 |
| **PQ** | **PQ** | | s-shaped | Ideaal (D) | 2 |
| | | | convex | Calima (D) | 3 |
| **30. (+)** | **32. (+)** | **VG** | **Pod: shape of distal part (excluding beak)** | | |
| **PQ** | **PQ** | | acute | Aiguillon (D), Calas (D), Cesar (D) | 1 |
| | | | acute to truncate | Aiguille vert (D), Faria (D) | 2 |
| | | | truncate | Afrio (D), Alcade (D), Divel (D) | 3 |
| **31.** | **33.** | **MS/VG** | **Pod: length of beak** | | |
| **QN** | **QN** | | short | Amity (D), Ryco (D) | 3 |
| | | | medium | Goldfish (D), Optimus (D) | 5 |
| | | | long | Facta (D), Golddukat (D), Vilbel (D) | 7 |
| **32.** | **34.** | **VG** | **Pod: curvature of beak** | | |
| **QN** | **QN** | | absent or very weak | | 1 |
| | | | weak | Nerina (D) | 3 |
| | | | medium | | 5 |
| | | | strong | Goldfish (C), Groffy (D), Ryco (D) | 7 |
| | | | very strong | | 9 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **33.** | **35.** | **VG** | **Pod: texture of surface** | | |
| **QN** | **QN** | | smooth | Prelude (D), Tuf (D) | 3 |
| | | | moderately rough | Daisy (D), Longking (D), Blauhilde (C) | 5 |
| | | | very rough | | 7 |
| **34.** | **36.** | **VS/VG** | **Pod: constrictions (at dry stage)** | | |
| **QN** | **QN** | | absent or very weak | Pascal (D), Regulex (D) | 1 |
| | | | moderate | | 2 |
| | | | strong | Mechelse Tros (C) | 3 |
| **35.** | **37.** | **MS/MG** | **Seed: weight** | | |
| **(+)** | **(+)** | | very low | Cabri (D), Decibel (D), Label (D) | 1 |
| **QN** | **QN** | | low | Belfin (D), Ingo (D) | 3 |
| | | | medium | Duplika (D), Konservenstolz (D), Juwagold (C) | 5 |
| | | | high | Regulex (D), Fidel (C) | 7 |
| | | | very high | Facta (D), Rote von Paris (D), Precores (C) | 9 |
| **36.** | **38.** | **VG** | **Seed: shape of median longitudinal section** | | |
| **(+)** | **(+)** | | circular | Coblan (D), Coco nain blanc précoce (D), Rapsani (D) | 1 |
| **PQ** | **PQ** | | circular to elliptic | Coco noir (D) | 2 |
| | | | elliptic | Nerina (D), Pros (D), Tuf (D) | 3 |
| | | | kidney-shaped | Orex (D), Palmares (D), Re Mida (D), Rubico (D) | 4 |
| | | | rectangular | Polanka (D) | 5 |
| **37.** | **39.** | **VG** | **Varieties with kidney-shaped seed only: Seed: degree of curvature** | | |
| **QN** | **QN** | | weak | Farcybel (D), Janus (D), Jakar (D) | 3 |
| | | | medium | Faria (D), Farno (D), Niver (D) | 5 |
| | | | strong | Chevrier vert (D), Hador (D) | 7 |

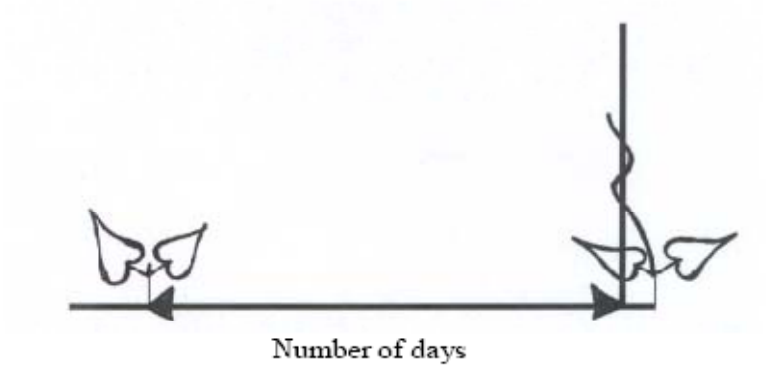
| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **38.** | **40.** | **VG** | **Seed: shape of median cross-section** | | |
| **(+)** | **(+)** | | flat | Soisson nain hatif (D) | 1 |
| **PQ** | **PQ** | | narrow elliptic | Roi de Belges (D), Samurai (D) | 2 |
| | | | medium elliptic | Orlinel (D), Pluto (D), Rachel (D) | 3 |
| | | | broad elliptic | Obélique (D), Odessa (D), Primanor | 4 |
| | | | circular | Pactol (D), Romulus (D), Starnel | 5 |
| **39.** | **41.** | **MS/VG** | **Seed: width in cross-section** | | |
| **(+)** | **(+)** | | narrow | Cabri (D), Golddukat (D) | 3 |
| **QN** | **QN** | | medium | | 5 |
| | | | broad | Pfälzer Juni (D), Rote von Paris (D) | 7 |
| **40.** | **42.** | **MS/VG** | **Seed: length** | | |
| **(+)** | **(+)** | | short | Raba (D) | 3 |
| **QN** | **QN** | | medium | Igolomska (D) | 5 |
| | | | long | Nigeria (D) | 7 |
| **41.** | **43.** | **VG** | **Seed: number of colours** | | |
| **QL** | **QL** | | one | | 1 |
| | | | two | | 2 |
| **G** | | | more than two | | 3 |
| **42.** | **44.** | **VG** | **Seed: main colour (largest area)** | | |
| **PQ** | **PQ** | | white | Goldfish (D), Tuf (D) | 1 |
| | | | green or greenish | Muriel (D), Pascal (D) | 2 |
| | | | grey | | 3 |
| | | | yellow | Gele Citroen (D) | 4 |
| | | | beige | Purple Teepee (D), Blauhilde (C) | 5 |
| | | | brown | Primel (D), Sunray (D) | 6 |
| | | | red | Flageolet rouge (D) | 7 |
| | | | violet | | 8 |
| **G** | | | black | Delinel (D), Vilbel (D) | 9 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **43.** | **45.** | **VG** | **Seed: predominant secondary colour** | | |
| **(+)** | **(+)** | | grey | | 1 |
| **PQ** | **PQ** | | yellow | | 2 |
| | | | beige | | 3 |
| | | | brown | | 4 |
| | | | red | Fiori (D) | 5 |
| | | | violet | Marbel (D) | 6 |
| **G** | | | black | Brittle Wax (D) | 7 |
| **44.** | **46.** | **VG** | **Seed: distribution of secondary colour** | | |
| **(+)** | **(+)** | | around hilum | Brittle Wax (D) | 1 |
| **QL** | **QL** | | on half of grain | | 2 |
| | | | on entire grain | | 3 |
| **45.** | **47.** | **VG** | **Seed: veining** | | |
| **QN** | **QN** | | weak | Prelude (D), Ryco (D) | 3 |
| | | | medium | Loma (D) | 5 |
| | | | strong | Daisy (D), Flo (D) | 7 |
| **46.** | **48.** | **VS/VG** | **Time of flowering (50% of the plants with at least one flower)** | | |
| **QN** | **QN** | | very early | Pfälzer Juni (D) | 1 |
| | | | early | Prelude (D), Fortissima (C), Perle von Marbach (C) | 3 |
| | | | medium | Fanion (D), Groffy (D), Hilda (C), Precores (C) | 5 |
| | | | late | Necores (C) | 7 |
| | | | very late | | 9 |
| **47.** **(+)** | **49.** **(+)** | **VS/VG** | **Resistance to Bean anthracnose (*Colletotrichum lindemuthianum*)** | | |
| **47.1** | **49.1** | | **Race Lambda** | | |
| **QL** | **QL** | | absent | Goldrush, Masai, Michelet | 1 |
| **G** | | | present | Booster, Pastoral | 9 |

| CPVO No. | UPOV No. | Stage, method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **47.2 (*)** | | **VS/VG** | **Race 6** | | |
| **QL** | | | absent | Goldrush, Masai, Michelet | 1 |
| **G** | | | present | Booster, Pastoral | 9 |
| **47.3** | **49.2** | **VS/VG** | **Race Kappa** | | |
| **QL** | **QL** | | absent | Goldrush, Masai, Michelet | 1 |
| | | | present | Booster, Pastoral | 9 |
| **48. (+) (*)** | **50. (+)** | **VS/VG** | **Resistance to Bean Common Mosaic Virus (BCMNV)** | | |
| **QL** | **QL** | | absent | Dufrix, Flandria | 1 |
| | | | present with necrosis | Booster, Odessa | 2 |
| **G** | | | present without symptoms | Bizet | 3 |
| **49. (+)** | **51. (+)** | **VS/VG** | **Resistance to Halo Blight (*Pseudomonas savastanoi* pv. *phaseolicola*), Race 6** | | |
| **QL** | **QL** | | absent | Michelet | 1 |
| | | | present | Masai , Vaillant | 9 |
| **50. (+)** | **52. (+)** | **VS/VG** | **Resistance to Common Blight (*Xanthomonas campestris* pv. *phaseoli*), Isolate 422** | | |
| **QL** | **QL** | | absent | Echo (D), Keygold (D) | 1 |
| | | | present | Walley (US line) (D) | 9 |

## EXPLANATIONS AND METHODS

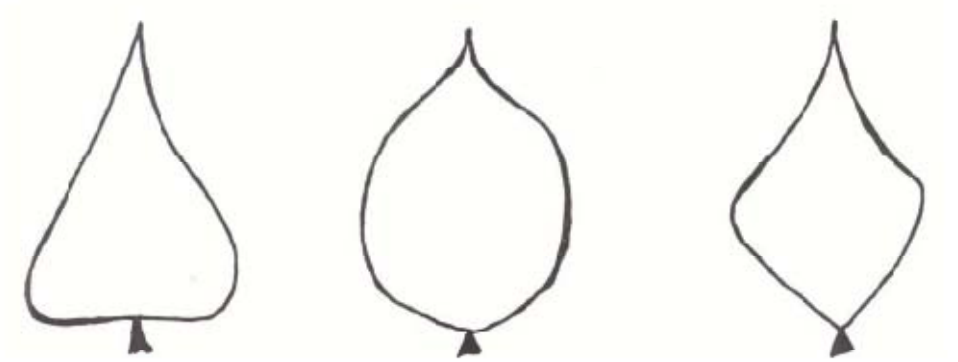
Ad 6: Climbing beans only: Plant: start of climbing (80% of plants)




Ad 7: Climbing beans only: Plant: speed of climbing

Number of days between the cotyledon leaf stage and reaching a height of 1.5 meters.

Ad 11: Terminal leaflet: shape



| 1 | 3 | 5 |
|---|---|---|
| triangular | circular | quadrangular |

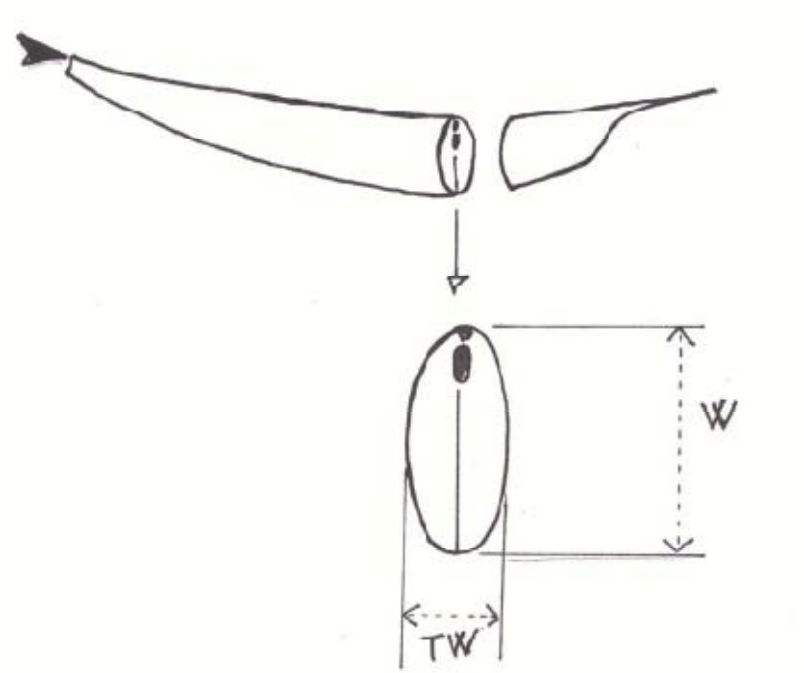
Ad 12: Terminal leaflet: apex

3
short acuminate

5
medium acuminate

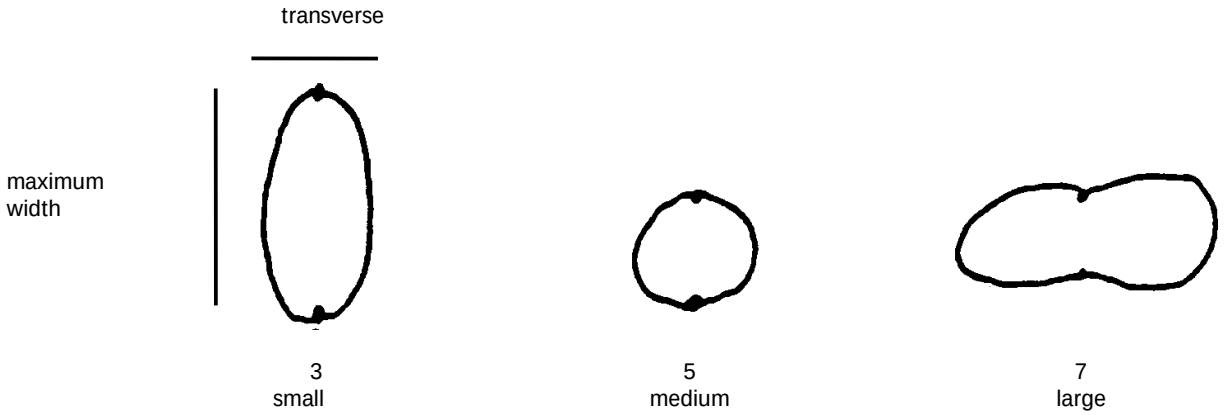
7
long acuminate

Ad 18, 19: Pod: width at maximum point
Pod: transversal width

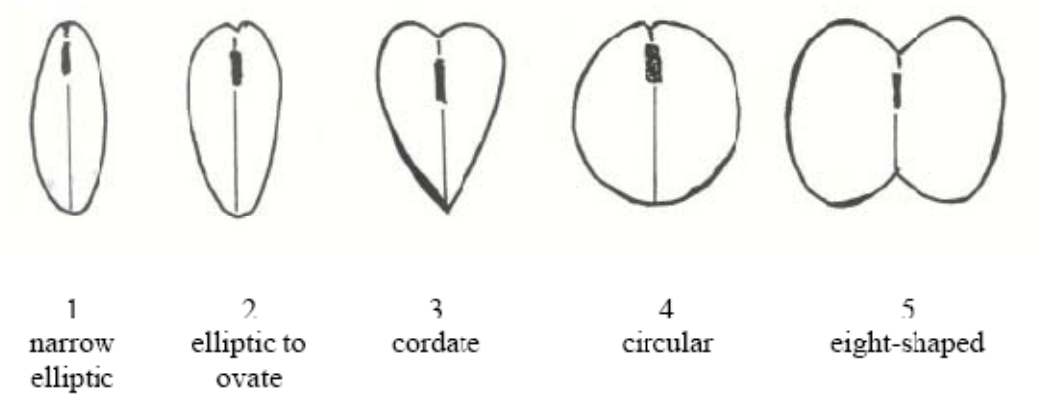



W = width at maximum point (characteristic 18)
TW = transversal width (characteristic 19)

Ad 20: Pod: ratio transversal width/width at maximum point




Ad 21: Pod: shape of cross section (through seed)




Ad 22, 23: Pod: ground colour
Pod: intensity of ground colour

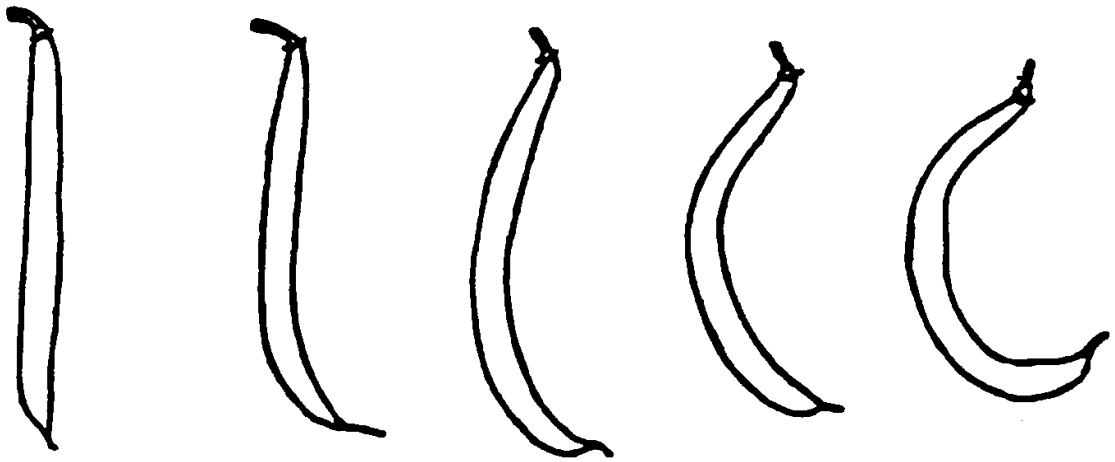
| | Characteristic 22: Pod: ground colour | | |
|---|---|---|---|
| Characteristic 23: Pod: intensity of ground colour | **yellow (1)** | **green (2)** | **violet (3)** |
| **light (3)** | Erato (D), Frühe dickfleischige Wachs (D), Goldmarie (C) | Rabl (D), Ragalla (D), Ryco (D), Fortissima (C) | |
| **medium (5)** | Gabriella(D), Goldfish (D), Goldelfe (C) | Filetty (D), Prelude (D), Tuf (D) | |
| **dark (7)** | Golddukat (D) | Decibel (D), Diva (D), Verona (D), Vilbel (D) | Purpiat (D), Purple Teepee (D), Blauhilde (C) |

Ad 27: Pod: stringiness on ventral suture

This characteristic should be observed just after the fresh market stage, by breaking the beak and pulling it from the pod. The stringiness emerges from the ventral suture of the pod.

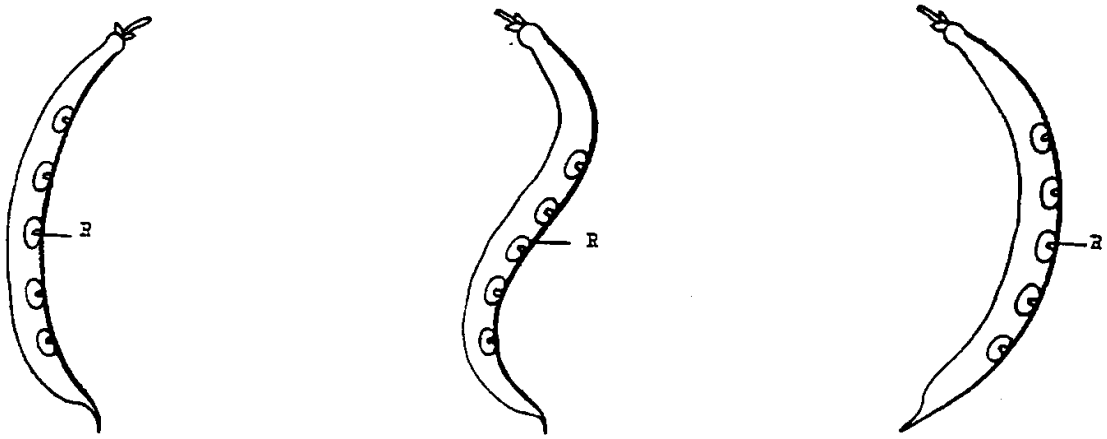
The string is very strong and should not be confused with the oakum, for example, which has a weaker structure.

Ad 28: Pod: degree of curvature



| 1 | 3 | 5 | 7 | 9 |
|---|---|---|---|---|
| absent or very slight | weak | medium | strong | very strong |

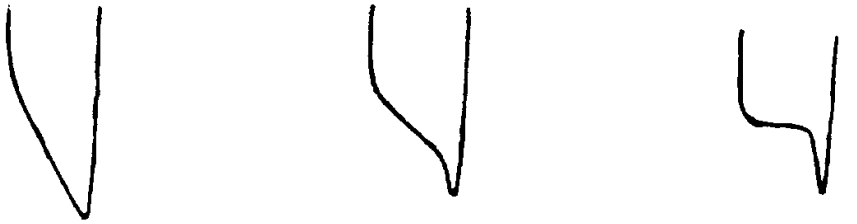
Ad 29: Pod: shape of curvature




| 1 | 2 | 3 |
|---|---|---|
| concave | s-shaped | convex |

R - dorsal suture

Ad 30: Pod: shape of distal part (excluding beak)



3
acute

5
acute to truncate

7
truncate

Ad 35: Seed: weight

The seed weight should be measured on four samples of 100 seeds.

Ad 36: Seed: shape of median longitudinal section

1
circular

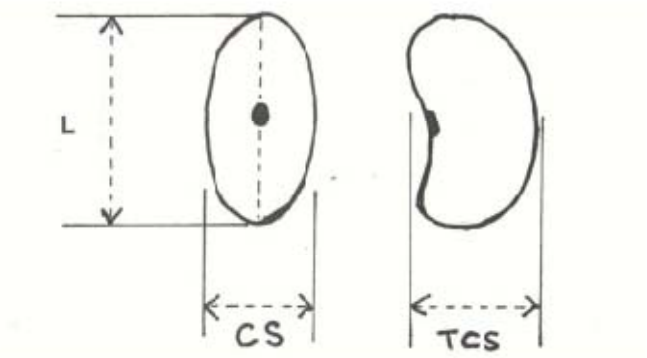
2
circular to elliptic

3
elliptic

4
kidney-shaped

5
rectangular

Ad 38, 39, 40: Seed: shape of median cross section
Seed: width in cross section
Seed: length




CS = shape of median cross section (38)
TCS = width in longitudinal cross section (39)
L = length (40)

Ad 43: Seed: predominant secondary colour

The predominant secondary colour is the colour with the second largest area. If several secondary colours exist, the competent authorities will add one or more characteristics as necessary.

Ad 44: Seed: distribution of secondary colour

1
around hilum

2
on half of grain

3
on entire grain

Ad 47: Resistance to Bean anthracnose (Colletotrichum lindemuthianum)

**Maintenance of strains**

Long term storage of strains: at -80°C in 20% glycerol
A strain that does not break the Are gene, for example strain Cl.6.A from SERIDA (Spain), belonging to race 6 is used.
Strains can be subcultured on PDA or Mathur media.

**Explanation of differences between races**

*Colletotrichum lindemuthianum* is a pathogen with highly variable virulence characteristics. Races are defined with a set of differential lines coded A-L (Table 1). Some races have been denominated with a Greek letter (e.g. Lambda, Kappa). More recently, all races have been defined by binary race names (the sum of the binary values of susceptible differentials).

Resistance against *Colletotrichum lindemuthianum* is also genetically diverse. For example race 31 (kappa) breaks the resistance in differential D and E and race 55 (lambda) breaks the resistance in differential E and F. Race 6 does not break the resistance in D, E and F.

Race 6, 31 and 55 do not break the resistances in differentials G-L and resistances based on combinations of resistance genes.

There are many more races than the three mentioned here. The importance of races may vary between regions.

| Old race name<br>Binary race name | | | | - | Lambda | Kappa |
|---|---|---|---|---|---|---|
| | | | | 6 | 55 | 31 |
| Letter code | Binary value | Gene | Differential | | | |
| A | 1 | | Michelite | R | S | S |
| B | 2 | Co-1 | Michigan Dark Red Kidney | S | S | S |
| C | 4 | Co-1-3 | Perry Marrow | S | S | S |
| D | 8 | Co-2 (Are) | Cornell 49242 | R | R | S |
| E | 16 | Co-1-2 | Widusa | R | S | S |
| F | 32 | Co-3 | Kaboon | R | S | R |
| G | 64 | | Mexico 222 | R | R | R |
| H | 128 | | PI 207262 | R | R | R |
| I | 256 | Co-4 | TO | R | R | R |
| J | 512 | Co-5 | TU | R | R | R |
| K | 1024 | Co-6 | AB 136 | R | R | R |
| L | 2048 | Co-4-2/5/7 | G 2333 | R | R | R |

**Execution of test**

Growth stage of plants
For inoculation by soaking seeds:
Pregermination of seeds in Petri dishes with moistured filter paper or on vermiculite for 4-5 days.

For inoculation by spraying cotyledons:
Seeds are sown on vermiculite or blotter for 2 days and transplanted in soil for 3 days.

The following varieties are used as controls. Each line will be represented by at least one variety which can be chosen in the varieties indicated. Pastoral can be added as resistant control as it has a weaker resistance and can give an indication on aggressiveness of the test

| Variety | Resistance phenotype |
|---|---|
| Goldrush, Michelet à longue cosse, Masai | S |
| Booster | R |

S = resistance absent; deeply sunken lesions or plant death
R = resistance present; superficial lesions or no symptoms

Temperature:
Test performed in climatic chambers or greenhouse at 20 -22°C. A high humidity is important for symptoms development.

Inoculum:
*Colletotrichum lindemuthianum* is grown on PDA or Mathur media for 7-20 days at 20 to 25°C. Spores are harvested with a scraper and suspension is adjusted to $10^6$sp/ml.

Method of inoculation

Two methods can be used for inoculation:

By soaking seeds:
Pre-germinated seeds are soaked in the inoculum suspension for 2 min. Seeds are transplanted in soil after inoculation.

By spraying cotyledons:
5 days after sowing cotyledons are sprayed with inoculum suspension.

Duration of test
12-14 days from sowing to notation.

Number of plants tested:
At least 20 plants.

Notation:
When symptoms are well developed on S control (usually after 7 to 14 days post inoculation).

Notation scale:

**For soaking seeds: 4 qualitative classes**
0: no symptoms
1: weak reaction with small superficial necrosis (dots or stripes)
2: deeply sunken necrotic flecks on hypocotyl or stem and /or strong reaction with necrosis larger than 3 mm sunk deeply into the tissue
3: dying plants

**For spraying cotyledons:**
No symptoms
Necrosis observed on plants (hypocotyls, stems, veins)

Analysis of results:

**For soaking seeds:**
R: classes 0: no symptoms and 1: superficial lesions
S: classes 2: deeply sunken lesions and 3: plant death

**For spraying cotyledons:**
R: no symptoms, some flecks of necrosis can occur in the stem and some necrosis in the cotyledons.
S: deep necrosis observed on plants

Ad 48: Resistance to Bean Common Mosaic Virus (BCMNV)

**Preliminary note on the BCMV/BCMNV complex of virus species**

Bean common mosaic (BCM) symptoms may be caused by two distinct virus species (BCMNV and BCMV) corresponding with serotype A (BCMNV) and B (BCMV) (Mink 1992, 1994; McKern 1992). These two viruses have been classified into seven pathogenicity groups based on their virulence pattern on a differential set of 11 varieties. Pathogenicity group PG-6 comprises the BCMNV strains NL3 and NL5. NL3 and NL5 have the ability to induce necrosis on bean varieties with gene I. Some strains have this ability only at high temperatures. The extent of necrosis may vary from local vein necrosis to top necrosis or in extreme cases whole plant necrosis (commonly called blackroot). Higher temperatures (26-32°C ) generally enhance necrosis and mosaic symptom expression compared with lower temperatures (20-25°C) (Drijfhout, 1978; Mavric and Sustar-Vozlic, 2004).
"In response to NL3 strain, the I+bc12 restricts necrosis to the veins of the inoculated leaves, a symptom referred to as localized vein necrosis; I+bc22 restricts necrosis to small lesions on the inoculated leaf, a symptom referred to as local lesion necrosis" (Miklas et al, 2000).

**Maintenance of BCMNV strains**

Strains are long term stored as desiccated leaves below 10°C (BOS). The Pathogenicity group PG-06 represented by strains NL5 or NL3 are used. Strains should be multiplied on the susceptible control before being used for inoculation of the test.

**Execution of test**

Growth stage of plants
Plants are grown in greenhouse or growth chamber until the first expanded leaf stage.

The following varieties are used as controls for NL3 and NL5 strains. Each line will be represented by at least one variety which can be chosen in the varieties indicated. Within each class there may be considerable variation in the phenotypic expression of the symptoms.

| Variety | Resistance phenotype NL3 or NL5 |
|---|---|
| Dufrix, Flandria | S |
| Booster, Odessa | RN |
| Bizet | R |

R = resistance present; no symptoms
RN = resistance present with vein or top necrosis
S = resistance absent; mosaic; leaf rolling

Temperature:
Test performed in climatic chambers or greenhouse at 25°C with an optional 5-7 days period at 30°C just after inoculation.

Method of inoculation
Mechanical inoculation by rubbing first expanded leaves with an inoculum solution consisting of symptomatic leaves grinded in a buffer with carborundum added. Leaves can be rinsed after inoculation.

Duration of test
At least 21 days from sowing to notation.

Number of plants tested:
At least 20 plants.

Notation:
When mosaic symptoms are well developed on S control (usually after 13-21 days)
Notation scale: 3 qualitative classes
1: mosaics and/or leaf rolling
2: top necrosis, or vein necrosis and/or small necrotic lesions in the leaf. Top necrosis is a systemic necrosis beginning at the apex of the plant whereas vein necrosis is a brown necrotic netting localized on veins.
3: without symptoms

Analysis of results:
S: 1: mosaics or leaf deformation
R: 2: top or vein necrosis. Top necrosis is a systemic necrosis whereas vein necrosis is a brow necrotic netting localized on veins.
R: 3: without symptoms

Genetic background
One dominant and several recessive resistance genes have been described. The dominant gene I is responsible for the necrotic response to specific virus strains and absence of symptoms to other strains. Several recessive bc genes may cause resistance without necrotic response.
These bc genes need to be combined with one or more other bc genes for being effective. The presence of bc genes or gene combinations may suppress the necrotic response of the I gene partially or completely. In that case the I gene is said to be "protected" by the action of the bc gene or genes (Strausbaugh et al, 2003; Vandemark and Miklas, 2005).

BCMNV Pathogenicity Group VI resistance (example strains: NL3 and NL5)

| | | Phenotype | Resistance Genes |
|---|---|---|---|
| 1 | resistance present | healthy | I gene + bc gene(s) or only bc genes |
| 2 | resistance present | necrosis | I gene + bc gene(s) or only I gene |
| 3 | resistance absent | mosaic; leafroll | |

Picture 1: BCMNV: Symptoms of vein necrosis (A) and small necrotic lesions (B)

A B

Ad 49: Resistance to Halo Blight (*Pseudomonas savastanoi* pv. *phaseolicola*)

**Maintenance of strains**

Isolates are long term stored at -80°C in glycerol (20%) or cryovial.
Race 6 represented by isolates PRI113, 7722a or HRI1299A is used.
Race 6 is the most frequent in Europe. Breeders use a broad (race-nonspecific) specific resistance. The use of an isolate of race 6 confirms broad resistance.
Isolates can be multiplied on King's B or YBC media.
Address of the following laboratories are able to provide isolates:
PRI113,: Naktuinbouw, NL
7722a : GEVES, FR
HRI1299A: HRI Warwick, UK INIA, ES (maintenance lab)

**Execution of test**

Growth stage of plants
Plants are grown in climatic chamber (or in glasshouse) for 7 to 15 days (first leaves stage just expanded).

The following standard varieties are used as controls. At least one resistant and one susceptible standard variety is necessary.

| Standard variety | Phenotype |
|---|---|
| Michelet à longue cosse | Susceptible |
| Masaï, Vaillant | Resistant |

S = resistance absent; water-soaked lesions, with or without halo and with or without systemic chlorosis.
R = resistance present; necrotic spots without water-soaked lesions or no symptom.

Temperature
Test performed in climatic chambers or in glasshouse at 18 to 20°C which represent the best conditions for symptom development. If temperatures are lower, symptoms will take longer time to develop. If temperatures are higher, less symptoms or necrotic symptoms will be obtained. A 100% relative humidity is important for symptoms development, especially in the first 24 hours after inoculation.

Inoculum
*Pseudomonas savastanoï* pv. *phaseolicola* is grown on King B or YBC medium for 1-4 days at 27°C.
A bacterial suspension with a concentration of $10^8$ cfu/mL is used.

Method of inoculation
An inoculation by spraying leaves with pressure (2 bars) until runoff will be preferred. For this purpose several equipments may be used: atomizer, paint brush, with a pressure supplier (compressor, bottles with propane/isobutene). Otherwise rubbing leaves with carborundum and sponge is possible.

Duration of test
2 to 4 weeks from sowing to notation.

Number of plants tested
At least 20 plants.

Notation
7-14 days after inoculation when symptoms are well developed on susceptible control. If symptoms are recorded later, wrong interpretation could occur.

Notation scale
Results observed on susceptible (resistance absent) and resistant (resistance present):

Resistant:
- no symptoms,
- necrotic pinpoints.

Susceptible:
- halo,
- water-soaked (looking oily) lesions,
    - few
    - many
- water-soaked lesions becoming necrotic in time (larger than pinpoints),
- deformation and chlorosis on first trifoliate leaves (phaseolotoxine),
- necrosis on stems,
- plants dying.

Inoculation may produce some damage on susceptible and resistant plants.

Analysis of results
Analysis of results should be calibrated with results on R and S controls.

Ad 50: Resistance to Common Blight (*Xanthomonas campestris* pv. *phaseoli*), Isolate 422

**Method**

Maintenance of races

Type of medium: ..... Infected, dry leaves

Execution of test

Growth stage of plants: ..... The first and second trifoliate leaves of 2 to 3 cm length

Temperature: ..... Day: 26°C; night: 20°C

Humidity: ..... 100% relative humidity during and 1 to 2 days after inoculation, thereafter normal relative humidity

Growing method: ..... In the glasshouse

Inoculum: ..... Bacterial suspension with a concentration of $10^8$ bacterial cells/ml.

Method of inoculation ..... Mechanical, using a camel-hair brush

Duration of test

- from inoculation to reading:..... Until infected leaves are fully developed

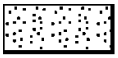
Number of plants tested: ..... 10-20 plants

Multiplication/propagation of bacteria: ..... 20 g extract of yeast powder, 20 g glucose, 20 g $CaCO_3$, 20 g agar-agar/1000 ml distilled water)

Remarks: ..... - Isolate 422 can be obtained from the Vegetable Research Institute, 1775 Budapest, P.O.Box 95, Hungary.

- The reaction of pods to *X. phaseoli* is not yet clear enough today.

Legend of illustration following hereafter:



healthy tissue

(2) dying tissues

(1) chlorotic tissue

(3) some cell-size brownish red hypersentive necrotic spots

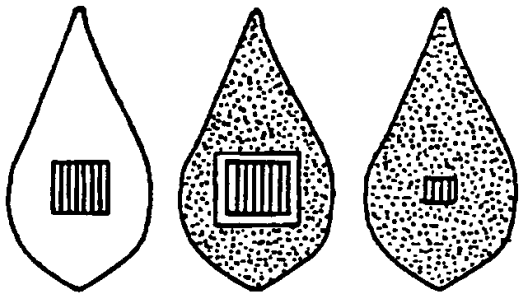
Scheme of observation

If chlorotic tissues (1) and/or dying tissue (2) are observed, the variety should be regarded as non-resistant.

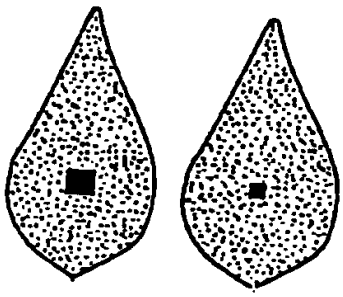
If only some cell-size brownish red hypersensitive necrotic spots (3) are observed, the variety should be regarded as resistant.

Possible combinations of symptoms

Resistance absent



Resistance present



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# ANNEXE II

CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

## TECHNICAL QUESTIONNAIRE

to be completed in connection with an application for Community Plant Variety Rights
Please answer all questions. A question without any answer will lead to a non-attribution of an application date. In cases where a field / question is not applicable, please state so.

**1.** **Botanical taxon:** Name of the genus, species or sub-species to which the variety belongs and common name

***Phaseolus vulgaris* L.**

FRENCH BEAN

**2.** **Applicant(s):** Name(s) and address(es), phone and fax number(s), Email address, and where appropriate name and address of the procedural representative

**3.** **Variety denomination**

a) Where appropriate proposal for a variety denomination:

b) Provisional designation (breeder's reference):

**4. Information on origin, maintenance and reproduction of the variety**

**4.1 Breeding, maintenance and reproduction of the variety**
Please indicate breeding scheme, parents, other relevant information

**4.2 Geographical origin of the variety:** the region and the country in which the variety was bred or discovered and developed

**4.3 Shall the information on data relating to components of hybrid varieties including data related to their cultivation be treated as confidential?**

[ ] YES [ ] NO

If yes, please give this information on the attached form for confidential information.

If no, please give information on data relating to components of hybrid varieties including data related to their cultivation:

Breeding scheme (indicate female component first)

**5. Characteristics of the variety to be indicated** (the number in brackets refers to the corresponding characteristic in the CPVO Protocol; please mark the state of expression which best corresponds).

| Characteristics | | Example varieties | Note |
|---|---|---|---|
| **5.1 (2)** | **Plant: growth type** | | |
| | dwarf | Callide (D), Capitole (D) | 1 [ ] |
| | climbing | Phenomene (C), Bacle (C) | 2 [ ] |
| **5.2 (15)** | **Flower: colour of standard** | | |
| | white | Tuf (D) | 1 [ ] |
| | pinkish white | | 2 [ ] |
| | pink | Maxi (D), Vilbel (D) | 3 [ ] |
| | violet | Delinel (D), Purple Teepee (D) | 4 [ ] |

| Characteristics | | Example varieties | Note |
|---|---|---|---|
| **5.3.1 (17.1)** | **<u>Dwarf beans only</u>: Pod: length (exlucing beak)** | | |
| | very short | | 1 [ ] |
| | short | Prelude (D), Tuf (D) | 3 [ ] |
| | medium | Amity (D), Lusia (D) | 5 [ ] |
| | long | Dubra (D), Loma (D) | 7 [ ] |
| | very long | Daisy (D), Longking (D), Maja (D) | 9 [ ] |
| **5.3.2 (17.2)** | **<u>Climbing beans only</u>: Pod: length (exlucing beak)** | | |
| | very short | | 1 [ ] |
| | short | Juwagold (C) | 3 [ ] |
| | medium | | 5 [ ] |
| | long | Fidel (C) | 7 [ ] |
| | very long | Toplong (C) | 9 [ ] |
| **5.4 (21)** | **Pod: shape of cross section (through seed)** | | |
| | narrow elliptic | | 1 [ ] |
| | elliptic to ovate | Pascal (D), Pfälzer Juni (D), Regulex (D) | 2 [ ] |
| | cordate | Daisy (D) | 3 [ ] |
| | circular | Tuf (D) | 4 [ ] |
| | eight shaped | Tendercrop White Seeded (D) | 5 [ ] |
| **5.5 (22)** | **Pod: ground colour** | | |
| | yellow | Golddukat (D), Goldfish (D), Goldmarie (C) | 1 [ ] |
| | green | Filetty (D), Diva (D), Fortissima (C) | 2 [ ] |
| | violet | Purpiat (D), Purple Teepee (D) | 3 [ ] |
| **5.6 (27)** | **Pod: stringiness on ventral suture** | | |
| | absent | Cabri (D), Tuf (D) | 1 [ ] |
| | present | Facta (D), Marbel (D) | 9 [ ] |

| | Characteristics | Example varieties | Note |
|---|---|---|---|
| **5.7 (35)** | **Seed: weight** | | |
| | very low | Cabri (D), Decibel (D), Label (D) | 1 [ ] |
| | low | Belfin (D), Ingo (D) | 3 [ ] |
| | medium | Duplica (D), Konservenstolz (D), Juwagold(C) | 5 [ ] |
| | high | Regulex (D), Fidel (C) | 7 [ ] |
| | very high | Facta (D), Rote von Paris (D), Precores (C) | 9 [ ] |
| **5.8 (41)** | **Seed: number of colours** | | |
| | one | | 1 [ ] |
| | two | | 2 [ ] |
| | more than two | | 3 [ ] |
| **5.9 (42)** | **Seed: main colour (largest area)** | | |
| | white | Goldfish (D), Tuf (D) | 1 [ ] |
| | green or greenish | Muriel (D), Pascal (D) | 2 [ ] |
| | grey | | 3 [ ] |
| | yellow | Gele Citroen (D) | 4 [ ] |
| | beige | Blauhilde (C), Purple Teepee (D) | 5 [ ] |
| | brown | Primel (D), Sunray (D) | 6 [ ] |
| | red | Fageolet rouge (D) | 7 [ ] |
| | violet | | 8 [ ] |
| | black | Delinel (D), Vilbel (D) | 9 [ ] |
| **5.10 (43)** | **Seed: predominant secondary colour** | | |
| | grey | | 1 [ ] |
| | yellow | | 2 [ ] |
| | beige | | 3 [ ] |
| | brown | | 4 [ ] |
| | red | Fiori (D) | 5 [ ] |
| | violet | Marbel (D) | 6 [ ] |
| | black | Brittle Wax (D) | 7 [ ] |

| Characteristics | | Example varieties | Note |
|---|---|---|---|
| **5.11 (46)** | **Time of flowering (50 % of the plants with at least one flower)** | | |
| | very early | Pfälzer Juni (D) | 1 [ ] |
| | early | Prelude (D), Fortissima (C), Perle von Marbach (C) | 3 [ ] |
| | medium | Fanion (D), Groffy (D), Labrador (D), Hilda (C), Precores (C) | 5 [ ] |
| | late | Necores (C) | 7 [ ] |
| | very late | | 9 [ ] |
| **5.12 (47.1)** | **Resistance to Bean anthracnose (*Colletotrichum lindemuthianum*), Race Lambda** | | |
| | absent | Goldrush, Masai, Michelet | 1 [ ] |
| | present | Booster, Pastoral | 9 [ ] |
| **5.13 (47.2)** | **Resistance to Bean anthracnose (*Colletotrichum lindemuthianum*), Race 6** | | |
| | absent | Goldrush, Masai, Michelet | 1 [ ] |
| | present | Booster, Pastoral | 9 [ ] |
| **5.14 (48)** | **Resistance to Bean Common Mosaic Virus (BCMV)** | | |
| | absent | Dufrix, Flandria | 1 [ ] |
| | present with necrosis | Booster, Odessa | 2 [ ] |
| | present without symptoms | Bizet | 3 [ ] |

**6. Similar varieties and differences from these varieties:**

| Denomination of similar variety | Characteristic in which the similar variety is different[1)] | State of expression of similar variety | State of expression of candidate variety |
|---|---|---|---|
| | | | |

[1)] In the case of identical states of expressions of both varieties, please indicate the size of the difference

**7. Additional information which may help to distinguish the variety**

**7.1 Resistance to pests and diseases**

| | | absent | present | not tested |
|---|---|---|---|---|
| i) | Resistance to Bean Anthracnose *(Colletotrichum lindemuthianum)* | | | |
| | a) Race Kappa (Characteristic 47.2) | [ ] | [ ] | [ ] |
| | b) Other races (specify) | [ ] | [ ] | [ ] |
| ii) | Resistance to Halo Blight *(Pseudomonas savastanoi pv. Phaseolicola)* | | | |
| | a) Race 6 (characteristic 49) | [ ] | [ ] | [ ] |
| | b ) Other races (specify) | [ ] | [ ] | [ ] |
| iii) | Resistance to Common Blight *(Xanthomonas campestris pv. vesicatoria)* | | | |
| | Isolate 422 (Characteristic 50) | [ ] | [ ] | [ ] |
| iv) | Other resistance to pests and diseases (specify) | [ ] | [ ] | [ ] |

**7.2 Special conditions for the examination of the variety**

i) Type of culture

- under glass [ ]
- in the open [ ]

ii) Part mainly consumed

- pod [ ]
- seed [ ]

iii) Main use

- fresh market or garden [ ]
- canning (indicate type) [ ]

iv) Other conditions

[ ] YES, please specify

[ ] NO

**7.3 Other information**

[ ] YES, please specify

[ ] NO

**8. GMO-information required**

The variety represents a Genetically Modified Organism within the meaning of Article 2(2) of Council Directive EC/2001/18 of 12/03/2001.

[ ] YES [ ] NO

If yes, please add a copy of the written attestation of the responsible authorities stating that a technical examination of the variety under Articles 55 and 56 of the Basic Regulation does not pose risks to the environment according to the norms of the above-mentioned Directive.

## 9. Information on plant material to be examined

**9.1** The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

**9.2** The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

| | | |
|---|---|---|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma) | [ ] Yes | [ ] No |
| (b) Chemical treatment (e.g. growth retardant or pesticide) | [ ] Yes | [ ] No |
| (c) Tissue culture | [ ] Yes | [ ] No |
| (d) Other factors | [ ] Yes | [ ] No |

Please provide details of where you have indicated "Yes":

I/we hereby declare that to the best of my/our knowledge the information given in this form is complete and correct.

Date Signature Name

[End of document]