Animal &
Plant Health
Agency

United Kingdom Variety List Trials: Trial Procedures for Official Examination of Value for Cultivation and Use (VCU) Harvest 2024

Field beans – spring and winter sown

Appendices

July 2023

Changes:

Contents

Scope

This document contains the appendices for the main guidance document:

Trial Procedures for Official Examination of Value for Cultivation and Use (VCU) Harvest 2024 – Field beans – spring and winter sown

Appendix 1 - Approved Trial Organisers/ Operators for field beans

Activity	Organisers/Operators responsible spring sown beans	Organisers/Operators responsible winter sown beans
Data handling operator	BioSS	BioSS
Trials organiser	BSPB	BSPB
Pathology trials operator	NIAB	None
Trial inspection	PGRO	PGRO
Technical validation operators	NIAB	NIAB
Quality testing operator	NIAB	NIAB
Data review and standard setting operator	NIAB	NIAB

Appendix 2 – Seed treatment and fungicide products for use on NL trials

Suitable products to be confirmed with the Trials Organiser.

Appendix 3 – Seed despatch deadline dates

Spring sown beans - 31 January

Winter sown beans – 1 October

Appendix 4 – Growing trial operators and trial locations

Growing trial operators/seed handling operators

Spring sown beans

Growing trial operators	Seed handling operator (if not trial operator)	Location of trial
LS Plant Breeding	Trial Operator	Impington, Cambridgeshire
Saaten Union	Trial Operator	Cowlinge, Suffolk
PGRO	Trial Operator	Stubton, Lincolnshire
Frontier Agriculture Ltd	Trial Operator	Stokesley, North Yorkshire

Winter sown beans

Growing trial operators	Seed handling operator (if not trial operator)	Location of trial
NIAB	Trial Operator	Headley Hall, North Yorkshire
PGRO	Trial Operator	Stubton, Lincolnshire
Darlow Contract Services Ltd	Trial Operator	Soham, Cambridgeshire
LS Plant Breeding	Trial Operator	Impington, Cambridgeshire
NIAB	Trial Operator	Callow, Herefordshire

Appendix 5 – Control varieties for VCU Assessments

Spring sown beans

Yield controls:

Lynx

Victus

Winter sown beans

Yield controls:

Vespa

Tundra (Yr2 Control)

Vincent (Yr1 Control)

Appendix 6 – Data submission dates

A To Trials Organisers

Record	Latest date of receipt by trials organiser
Site data part 1 (including site sketch)	Within 2 months of drilling trial (autumn sown trials) Within 1 month of drilling trial (spring sown trials)
Site data part 2	By the time trials harvested
Plot records (in approved electronic format)	Growing trial operator should notify trials organiser that trial has been harvested within 2 days of harvest

B Plot records to Data Handling Operator

Record	Latest date of receipt by trials organiser
Plot records SHOULD be sent to the Data Handling Operator	Within 10 days of record being taken

C Plot samples to Quality Testing Operator

Record	Latest date of receipt by trials organiser
Plot samples SHOULD be sent to the Data Handling Operator	Within 2 days of harvest

Appendix 7 – moisture content determination for yield

Moisture content % of harvested material enables yield at 17% moisture content to be calculated.

This can be determined by either of two methods.

1. The Oven Method. Here the sealed sample taken at harvest is dried in an oven until no more moisture can be removed. The dried weight is then recorded and by comparison with the pre-dried sample weight, moisture content can be calculated.

2. Harvesting and conditioning of each plot and then reweighing and measuring moisture content electronically.

Oven method

The following procedure must be followed:

1. A fully representative sub-sample of approx 500 grams is weighed to 1 decimal place and then placed in the drier, which must be at a temperature of 100°C ±4°C with the air recirculator set in the range 80-100% recirculation in order to restore the temperature to 100°C ±4°C as rapidly as possible. When the temperature is restored to 100°C ±4°C the air regulator is set at 80% recirculation i.e. 20% fresh hot air. The regulator is critical for rapid drying. The samples are dried at 100°C ±4°C for such time as is necessary for complete drying.

2. The dried sample is carefully removed from the drier as soon as the sample is cool enough for accurate weighing. The dry weight is recorded to one decimal place.

3. When all samples from a given trial have been recorded, the moisture content % must be immediately reported to the Data Handling Operator electronically using the character names given in Section C.6.3

Conditioning & Electronic Moisture Meter Method

Conditioning

1. Each plot must be harvested and the entire produce put into clean sacks or other suitable containers, labelled and sealed. The grain parcels should then be dried using a cold/warm air drier where the drying temperature is not in excess of 60°C.

2. The grain should be dried for such time as is necessary to reach equilibrium with their surroundings. The parcels should then be weighed and the moisture content recorded using an appropriate electronic moisture meter as set out below. The moisture content after drying must not exceed 17%.

3. The Growing Trial Operator returns the weight and moisture content to the Data Handling Operator.

Moisture meters

1. **Principles**

Moisture meters may only be used for the measurement of grain moisture below 17%. There are no restrictions on the make or model of moisture analyser that may be used, provided the conditions described below are met.

The manufacturer's recommendations for use must be followed. On-combine analysis is not approved, as currently no model is sufficiently accurate over the likely range of moisture contents.

2. Equipment

The analysing equipment must:

Be calibrated at least once annually for each crop according to the manufacturer's instructions using check samples (see reference below) and have a moisture content accuracy of plus/minus 0.5%. The calibration data should be retained for a minimum of 1 year.

Be serviced regularly, especially just prior to harvest, according to manufacturer recommendations. The action taken should be documented and the information held for a minimum of 1 year.

Be fit for use in accordance with manufacturer instructions. It should have an adequate power supply throughout operation. Instructions should be held with the machine and all operators adequately trained in its operation.

3. Measuring moisture in conditioned grain

The grain samples to be analysed must be between 12 to 17% moisture content.

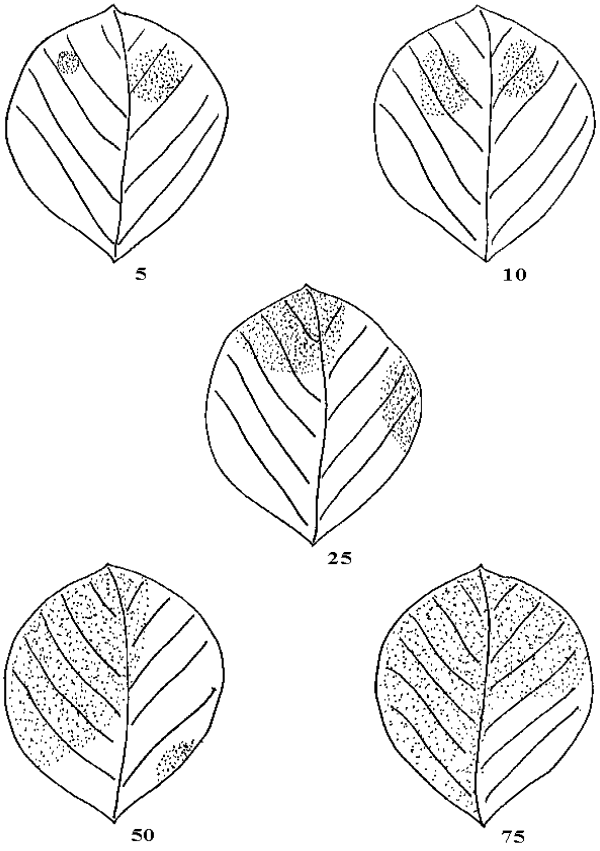
The grain to be analysed must be fully ripe. In other cases, the samples for the oven method should be used.

The data must be in the form of moisture content %.

References: BS ISO 7700-1:2008 Food products. Method of checking the calibration of moisture meters for cereals.

Appendix 8 – Downy mildew assessment key

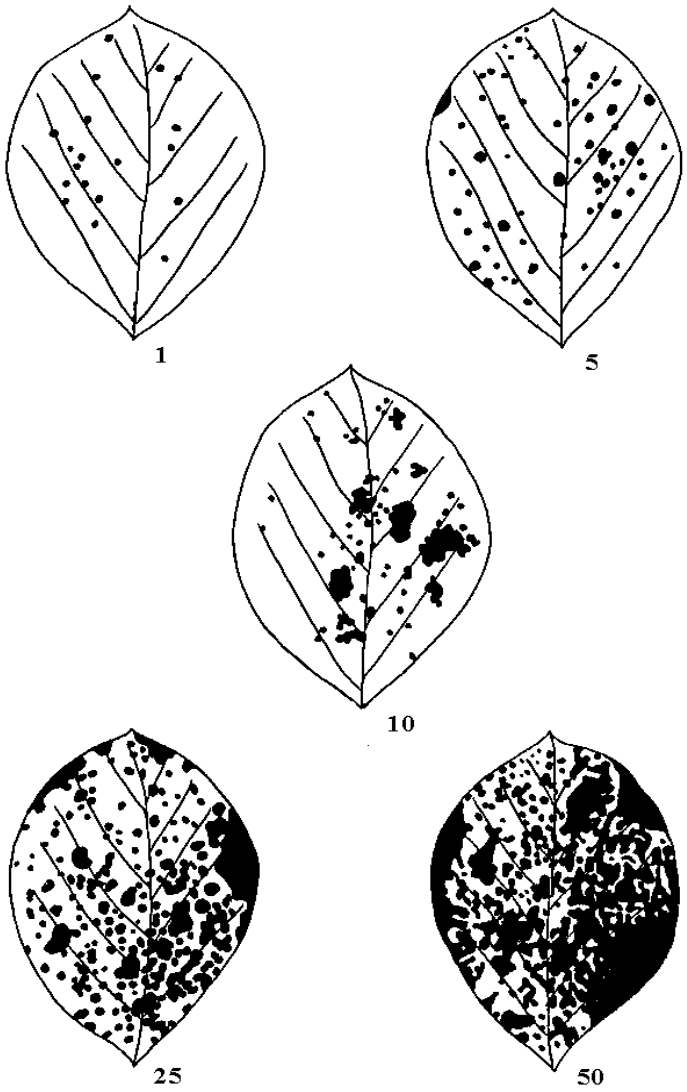
Downy Mildew *(Peronospora viciae)*



Examine all the leaves on plants within 4 to 6 areas of each plot, each area being approximately 1m^2. Assess the mean % leaf area infected with downy mildew, the leaf area diagrams may be used as a guide.

Appendix 8 – Chocolate spot

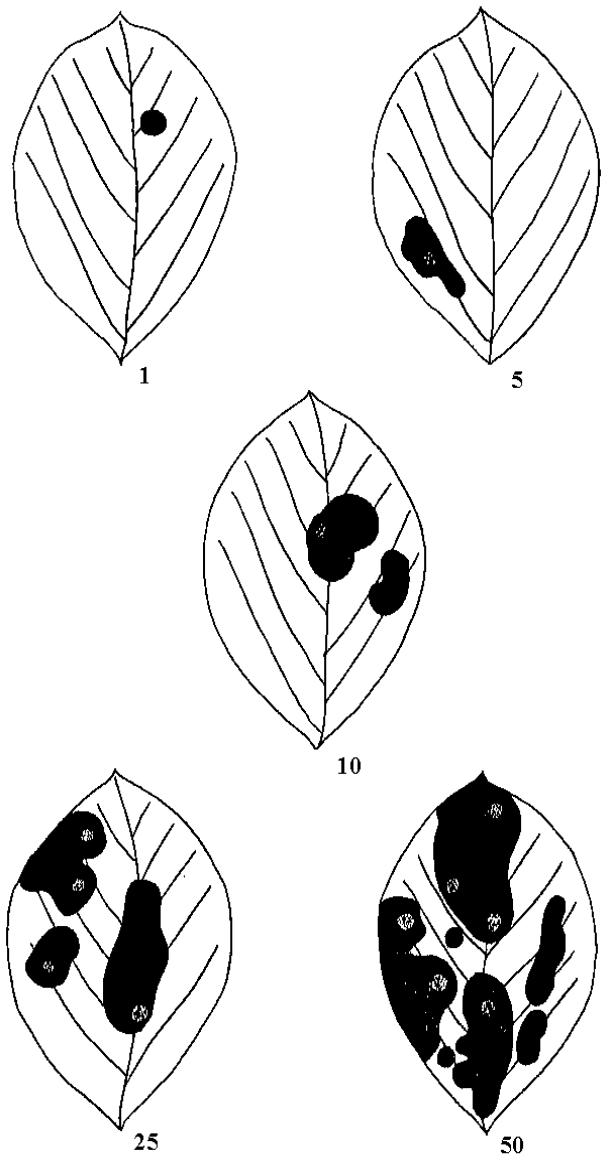
(*Botrytis fabae Sardina and Botrytis cinerea* Fr.)



Examine all the leaves on plants within 4 to 6 areas of each plot, each area being approximately $1m^{2-}$ assess the mean % leaf area infected with chocolate spot, the leaf area diagrams may be used as a guide. It is sometimes helpful to divide the stems into thirds when making assessments, but transmitted data must consist of a % leaf area infected score for the whole plot.

Appendix 8 – Leaf and pod spot

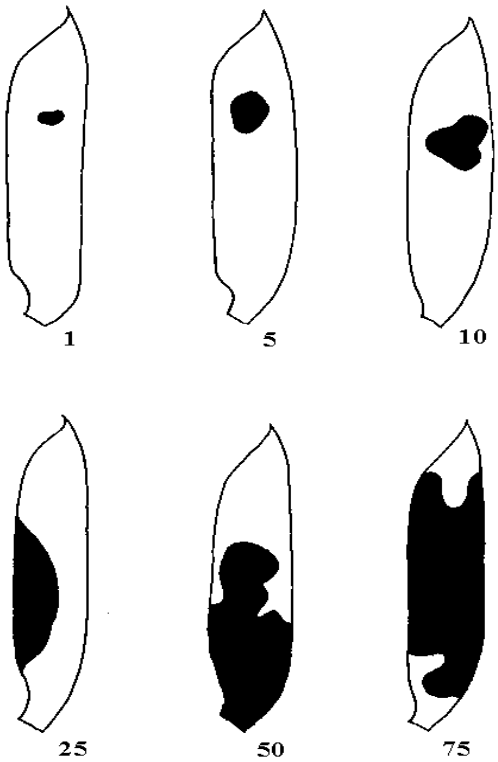
(Ascochyta fabae Spec.)



Examine all the leaves or pods on plants within 4 to 6 areas of each plot, each area being approximately 1m^2 assess the mean % leaf or pod area infected with Ascochyta, the leaf and pod area diagrams may be used as a guide. It is sometimes helpful to divide the stems into thirds when making leaf assessments, but transmitted data must consist of a % leaf area infected score for the whole plot. Pod infections should be assessed at G.S 207 before the pods turn brown.

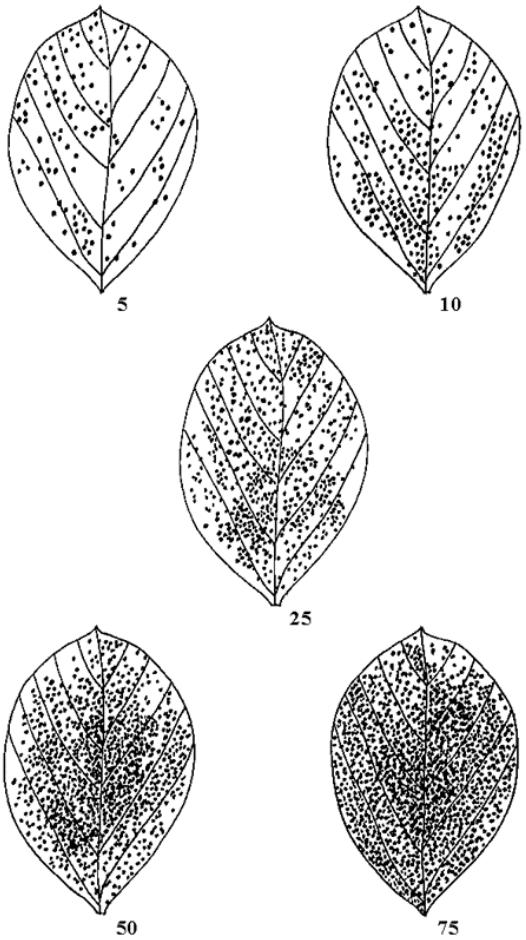
Appendix 8 – Leaf and pod spot

(*Ascochyta fabae* Speg.)



Appendix 8 – Bean Rust

Bean Rust (*Uromyces fabae*)



Appendix 9 – Phenological growth stages and BBCH-identification keys of faba bean (*Vicia faba* L.)

Weber and Bleiholder, 1990; Lancashire et al., 1991

The extended BBCH-scale is a system for a uniform coding of phenologically similar growth stages of all mono- and dicotyledonous plant species. The decimal code, which is divided into principal and secondary growth stages, is based on the well-known cereal code developed by ZADOKS et al. (1974) in order to avoid major changes from this widely used phenological key.

- The general scale forms the framework within which the individual scales are developed. It can also be used for those plant species for which no special scale is currently available.
- Similar phenological stages of each plant species are given the same code
- For each code, a description is given, and for some important stages, drawings are included
- For the description of the phenological development stages, clear and easily recognised (external) morphological characteristics are used.
- Except where stated otherwise, only the development of the main stem is taken into consideration
- The growth stages refer to representative individual plants within the crop stand. Crop stand characteristics may also be considered.
- Relative values relating to species- and/or variety-specific ultimate sizes are used for the indication of size.
- The secondary growth stages 0 to 8 correspond to the respective ordinal numbers or percentage values. For example, stage 3 could represent: 3rd true leaf, 3rd tiller, 3rd node or 30% of the final length or size typical of the species or 30% of the flowers open.
- Post-harvest or storage treatment is coded 99.
- Seed treatment before planting is coded 00.

The entire developmental cycle of the plants is subdivided into ten clearly recognizable and distinguishable longer-lasting developmental phases. These principal growth stages are described using numbers from 0 to 9 in ascending order. Owing to the very many different plant species there may be shifts in the course of the development or certain stages may even be omitted. The principal growth stages need not proceed in the strict sequence defined by the ascending order of the figures but can occasionally also proceed in parallel.

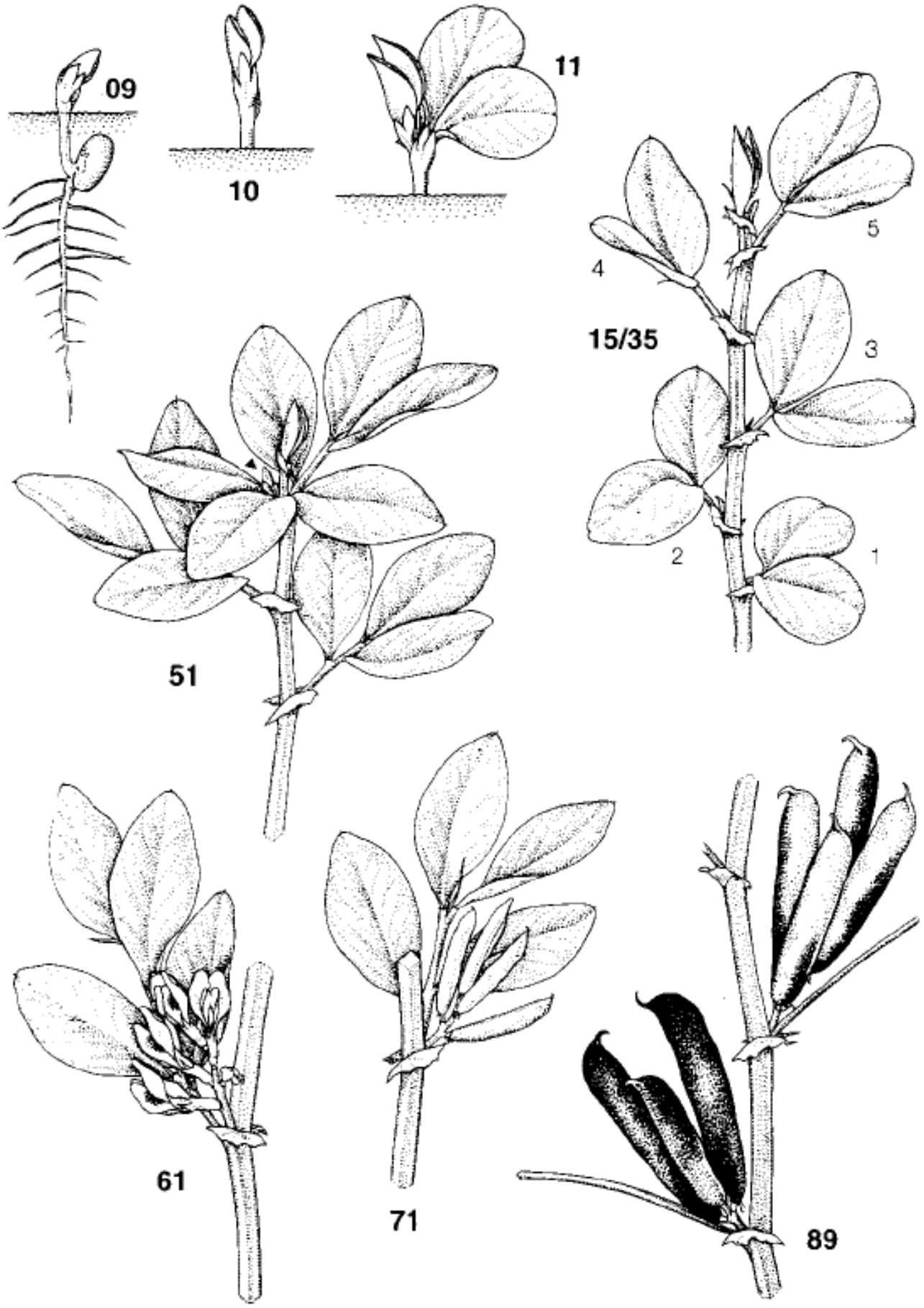
Principle growth stage 0: Germination	
Code	Description
00	Dry seed
01	Beginning of seed imbibition
03	Seed imbibition complete
05	Radicle emerged from seed
07	Shoot emerged from seed (plumule apparent)
08	Shoot growing towards soil surface
09	Emergence: Shoot emerges through soil surface
Principle growth stage 1: leaf development [1]	
Code	Description
10	Pair of scale leaves visible (may be eaten or lost)
11	First leaf unfolded
12	2 leaves unfolded
13	2 leaves unfolded
1.	Stages continuous till……
19	9 or more leaves folded
[1] Stem elongation may occur earlier than stage 19; in this case continue with the principal stage 3	

Principle growth stage 2: Formation of side shoots	
Code	Description
20	No side shoots
21	Beginning of side shoot development: first side shoot detectable
22	2 side shoots detectable
23	3 side shoots detectable
2.	Stages continuous till……
29	End of side shoot development: 9 or more side shoots detectable
Principle growth stage 3: Stem elongation	
Code	Description
30	Beginning of stem elongation
31	One visibly extended internode [2]
32	2 visibly extended internodes
33	3 visibly extended internodes
3	Stages continuous till …..
39	9 or more visibly extended internodes
[2] First internode extends from the scale leaf node to the first true leaf node	
Principle growth stage 5: Inflorescence emergence	
Code	Description
50	Flower buds present, still enclosed by leaves
51	First flower buds visible outside leaves
55	First individual flower buds visible outside leaves but still closed

59	First petals visible, many individual flower buds, still closed

Principle growth stage 6: flowering	
Code	Description
60	First flowers open
61	Flowers open on first raceme
63	Flowers open 3 racemes per plant
65	Full flowering: flowers open on 5 racemes per plant
67	Flowering declining
69	End of flowering
Principle growth stage 7: Development of fruit	
Code	Description
70	First pods have reached final length (“flat pod”)
71	10% of pods have reached final length
72	20% of pods have reached final length
73	30% of pods have reached final length
74	40% of pods have reached final length
75	50% of pods have reached final length
76	60% of pods have reached final length
77	70% of pods have reached final length
78	80% of pods have reached final length
79	Nearly all pods have reached final length

Principle growth stage 8: ripening	
80	Beginning of ripening: seed green, filling pod cavity
81	10% of pods ripe, seeds dry and hard
82	20% of pods ripe, seeds dry and hard
83	30% of pods ripe and dark, seeds dry and hard
84	40% of pods ripe and dark, seeds dry and hard
85	50% of pods ripe and dark, seeds dry and hard
86	60% of pods ripe and dark, seeds dry and hard
87	70% of pods ripe and dark, seeds dry and hard
88	80% of pods ripe and dark, seeds dry and hard
89	Fully ripe: nearly all pods dark, seeds dry and hard
Principle growth stage 9: senescence	
93	Stems begin to darken
95	50% of stems brown or black
97	Plant dead and dry
99	Harvested product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