



Animal &
Plant Health
Agency

Great Britain and Northern Ireland Variety List Trials: Trial Procedures for Official Examination of Value for Cultivation and Use (VCU) including appendices

Harvest 2027

Soya Bean

April 2026

Changes since last version (September 2025)

- Included Appendices in document, updated title and contents to reflect this change
- Added C.2.6
- Updated language of C.3.3.3.
- Added C.3.4.5
- Removed Appendix 8.3

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Section A – Summary of VCU trial assessments required

| Type of character | Reference | Description of assessment - Obligatory | Description of assessment – Additional (Assessed only if requested by applicant.) |
|--|-----------|--|---|
| Yield | Section C | Plot yield Moisture content | |
| Impact of environment | Section C | Standing ability Maturity | <i>Straw length</i> |
| Resistance to harmful organisms | Section D | None routinely recorded | |
| Quality characteristics (Laboratory Tests) | Section E | Oil content Protein content | |

Further measurements

The following must be measured or recorded in all trials, following procedures in Section C:

- **Sowing date**
- **Plant population (where this affects the validity of the trial)**
- **Harvest date**
- **Plot size**
- **Bird damage (where present at a level which will affect results)**

Section B – Seed handling procedures

B.1 Seed handling procedures

B.1.1 See GENERAL INFORMATION, SECTION 5 - Minor Crop VCU Procedures Introduction.

B.2 Authentication of VCU seed

B.2.1 The Seed Handling Operator must forward 200 grams of untreated sample of the seed submitted of every variety in the trial, for authentication by the DUS test centre by the date specified by APHA. The Trials Organiser will notify the minimum quantity required to Seed Handling Operators annually.

Section C – Growing trial procedures

C.1 Responsibilities

C.1.1 The Growing Trial Operators are responsible for conducting the trials according to these procedures.

C.2 Site suitability

C.2.1 The Growing Trial Operator will be responsible for providing a suitable site, which meets the following criteria:

C.2.2 Previous cropping must be appropriate for a soya bean crop to be grown. There should be at least a 3-year gap between soya bean and any other crop susceptible to sclerotinia.

C.2.3 Soil type should be typical of those on which soya beans are grown locally. Soil fertility and texture should be uniform across the site. The soil should be sufficiently uniform with no substantial variations in previous cropping, ridges, furrows, etc.

C.2.4 The trial should be sited away from trees, hedges, headlands, and other features, which are likely to cause uneven growth or encourage grazing damage from birds, rabbits, hares, mice etc.

C.2.5 The trial area should be cultivated in the direction of ploughing and drilled across the direction of ploughing and cultivation such that each plot receives similar wheeling compaction. Cultivations should follow best local practice.

C.2.6 Site selected should not have had any trial in the previous year.

C.3 Sowing the trial

C.3.1 Plot size

C.3.1.1 The harvested plot area must not be less than 15 m² per replicate for trials with 4 replications and 25 m² per replicate for trials with 3 replications. Plots must be drilled to a greater length than required and cut back to the required length prior to harvest. The plot width for calculating harvested area is measured centre gap to centre gap with an interplot gap in the range 0.5 m to 0.8 m.

C.3.2 Plant population

C.3.2.1 Seed is supplied to trial sites chemically treated in plot modules. The seed rate for conventional varieties will be 65 seeds/m². Bulks may be supplied on request, for which 1000 seed weights will be provided, so that plot packets can be prepared.

The following formula will be used to calculate the seed rate for a given thousand seed weight:

$$\text{Seed rate (kg/ha)} = \frac{((\text{Target population} \times \text{Thousand seed weight}) \times 100)}{(\text{Establishment\%} \times \text{Germination \%})}$$

For operators using seed counters the following formula can be used to calculate required seed numbers per plot:

$$\text{Seeds per plot} = \frac{((\text{Target population} \times \text{Drilled plot area}) \times 10,000)}{(\text{Establishment \%} \times \text{Germination \%})}$$

The likely establishment % should be judged carefully depending on soil conditions and seedbeds. Growing Trial Operators are responsible for achieving the correct target populations.

C.3.3 Trial layout

C.3.3.1 The Trials Organiser following consultation with APHA produces provisional sowing lists. The Trials Organiser will make final sowing lists available to Growing Trial Operators, along with the trial plans produced by the Trial Design and Data Handling Operator.

C.3.3.2 The trial should be sown according to the plan produced by the Trial Design and Data Handling Operator and may be an incomplete block design. In an incomplete block design, each replicate is split into a number of sub-blocks. Any splitting of replicates must be between sub-blocks and not through sub-blocks. Varieties can be moved within a sub-block but must not be moved from their sub-block. Varieties must not be moved around within the plan e.g. if drilling errors occur. If plots are moved out of their original sub-block they will have to be treated as missing plots. If there are any queries, please contact the Trial Design and Data Handling Operator.

C.3.3.3 Ideally the trial will be located in a commercial crop and at least one discard run must be drilled on either side of the trial. If the trial is not in a commercial crop at least one discard run must be drilled on all sides of the trial with the same drill and at the same time that the trial is drilled.

C.3.4 Drilling

C.3.4.1 Care must be taken with drill settings and drilling speed to ensure satisfactory and uniform establishment and plant population from plot to plot. It is also important to ensure that there is no carry over of seed between plots.

C.3.4.2 At least one discard plot must be drilled on either side of the trial with the same drill and at the same time that the trial is drilled.

C.3.4.3 Precautions must be taken to avoid any missing rows. Any missing rows or parts of rows must be noted in the trial diary and reported to the Trials Organiser within one month of emergence.

C.3.4.4 Soya bean is a legume and will fix nitrogen. However, nodulation will only occur if the correct Rhizobium strain is applied as a coating to the seed prior to drilling. This inoculant will be supplied by the Growing Trial Operator.

C.3.4.5 As a minimum, plot one should be labelled within one month of drilling.

C.3.5 Confirmation of trial layout

C.3.5.1 After full establishment and within one month of sowing, the Growing Trial Operator must confirm that the trial has been sown to plan or give details of any changes to plan. This should be done by clearly highlighting the changes in the electronic plan and returning it to the Trial Design and Data Handling Operator.

- Return a completed site data 1 sheet including the following information:
- Site location details including how to get to the field.
- Sketch showing the layout of the trial in the field, in relation to other trials and showing access roads, gates, etc. The location of these features should utilise the navigation platform [What3Words.com](https://www.what3words.com)
- Trial sketch showing plot numbers and variety codes and/or names.
- A short post-establishment report of the condition of the trial.

C.4 Husbandry

C.4.1 Agronomy

Where not specified in these procedures agronomy should follow best local practice, advisory and regulatory guidelines. Application of fertilisers and sprays should be uniform. It is normally best to apply these across the direction of the plots. Application wheelings should not run through the harvested plot area.

C.4.2 Fertiliser application

It should take into account inherent fertility, previous cropping, winter rainfall, the best local practice. All fertiliser applications should take account of the AHDB Nutrient Management Guide (RB209), the corresponding advisory publications in England, Wales, Scotland and Northern Ireland and past trialling experience.

C.4.3 Herbicides

The Trials Organiser must be consulted.

C.4.4 Growth regulators

Chemicals should not be used on soya bean trials solely for the purpose of growth regulation.

C.4.5 Pest and disease control

C.4.5.1 Pest control

Trials should be protected against damage by birds and approved means should be used to prevent or minimise damage by other field pests.

C.4.5.2 Disease control

Disease control should only be undertaken after agreement by the Trials Organiser.

C.4.6 Irrigation

Irrigation is permitted to facilitate establishment.

C.4.7 Pathways

Internal pathways should be made after the risk of pigeon damage has passed.

C.5 Harvesting

C.5.1 Timing of harvesting

C.5.1.1 Date of harvesting will be determined by the Growing Trial Operator based on crop maturity and local weather conditions.

C.5.2 Harvesting method:

Trials should be direct combined.

C.5.3 Samples

C.5.3.1 Samples are required from all plots for moisture content determination using the oven method, oil content determination and protein content determination. If additional samples are required, they will be notified to the Growing Trial Operator by the Trials Organiser.

C.5.3.2 It is essential that all samples:

- Are representative of the variety/plot from which they are taken with minimal contamination. When sampling on-combine, it is essential to minimise the risk of contamination of grain from the previous plot.
- Are taken from the same source.
- Contain the weight of grain requested.

C.5.3.3 A single 1 kg sample must be taken from each plot at harvest and sealed in a polythene bag for moisture content, oil content and protein content determination. Place one label on the inside of each bag and seal them by rolling over the top and securing the bags and the second labels with rubber bands.

C.5.3.4 Samples may not be required from every variety - the Trials Organiser will provide details of which varieties require samples, the quantities required and the tests to be carried out.

C.5.3.5 All plot samples must be labelled with trial identification number, variety name/breeders' reference, AFP number, plot number and Growing Trial Operator identification number.

C.5.4 Submission of data and samples

C.5.4.1 Appendix 6 lists the records, with deadlines, to be sent to the Trials Organiser. Diary sheets and any other field records should be returned to the Trials Organiser within 5 working days of harvest.

C.5.4.2 All plot records should be transmitted to the Trial Design and Data Handling Operator following the deadlines set out in Appendix 6. The Growing Trial Operator should ensure that data are free from errors before transmission. After scrutiny, copies of the results will be returned to the Growing Trial Operator for action as agreed by the Trials Organiser.

C.5.4.3 All samples should be sent to the appropriate Quality Testing Operator following the deadlines set out in Appendix 6.

C.6 Records

C.6.1 There are four components:

1. **Diary** Field notes of trial status.
- 2.* **Site data part 1** Including full location details:
 - 1) map of site location showing nearby settlements and roads,
 - 2) a sketch showing the layout of trials in the field with access points and
 - 3) trial layout, showing plot numbers and variety codes/names.
- 3.* **Site data part 2** Details of agrochemical applications and irrigation.
4. **Plot records** Plot data.

* Template available from Trials Organiser

C.6.1.1 An entry in the Diary sheet should be made on every trials visit and any observations relevant to variety performance should be recorded. If the trial is in good condition, with no problems, this should be recorded.

C.6.3.2 STANDING ABILITY **from all plots** **(OBLIGATORY)** **(1-9)**

- 1 very poor
- 9 very good

This should be assessed on sequential occasions and **MUST** be recorded at harvest time (maturity).

C.6.3.3 STRAW LENGTH *from all plots* *(ADDITIONAL)* *(cm)*

Straw length should be measured on 5 or more randomly selected plants per plot after cessation of growth. The measurement should be the full length from ground level to the top of the extended main stem.

C.6.3.4 MATURITY **from all plots** **(OBLIGATORY)** **(1-9)**

Maturity should be judged by making a visual estimate of canopy senescence, where:

- 1 Stems and pods green
- 9 Stems and pods bleached and brittle, seeds hard

C.6.3.5 SOWING DATE **(OBLIGATORY)** **(Day/month/year)**

This is recorded in Part 1 of the Site Information Form

C.6.3.6 PLANT POPULATION **(OBLIGATORY)** **(plants/m²)**

Plant counts should be taken soon after full emergence. Two methods can be used: Take three or four random linear metre counts per plot from the middle rows. It is important that the row width and length measured (in metres) are entered after the character name so that the number of plants per m² can be calculated.

Count the plants within three or four quadrats per plot. The quadrats should be 0.25m to 1m² in size. The size used must be quoted.

C.6.3.7 HARVEST DATE **from all plots** **(OBLIGATORY)** **(Day/month/year)**

The date on which each plot is harvested must be recorded. The date should be given numerically as day, month, year.

C.6.3.8 BIRD DAMAGE **from all plots** **(OBLIGATORY IF PRESENT)** **(1-9)**

- 1 severe damage
- 9 no damage

Assessments should be made as appropriate. Records of Bird Damage which affects the yield of the trial should accompany the yield data.

C.6.3.9 Site factors

Any factors which may have affected the yield of the trial or individual plots must be noted and accompany the yield data.

Where varietal differences are seen in pest or disease attack, records should be made either as an estimate % of plants affected, or as % leaf area attacked in accordance with the procedure in Section D for disease.

Records for other scores should be taken as % plants affected. Include definitions of 1 to 9 on the scale.

C.6.3.10 Trial Inspection

All trials will be inspected by the Trial Inspection and Technical Validation Operator, and, in some cases, it may be necessary to visit on more than one occasion.

The requirements for Growing Trial Operators in respect of inspections are to:

1. Give inspectors reasonable access to trials and to provide full location and site details (if not already given with site data 1).
2. Provide the inspector with information (for example pesticide sprays applied etc) within seven days of a request.
3. Co-operate with the inspector in making any non-routine assessments required to establish the validity of the trial (for example population counts).
4. Carry out any action agreed in consultation with the inspector. In particular it is important that any requirement to shorten plots is undertaken. The data on plots that the trials operator and inspector agree to exclude should not be submitted.

Section D – Disease Testing Procedures

D.1 Assessment of natural infection

D.1.1 Disease observation plots

No disease observation plots are carried out routinely

D.1.2 Naturally occurring disease in VCU growing trials

The Growing Trial Operator is responsible for carrying out these procedures.

D.1.3 Diseases recorded

Foliar disease should be recorded when the level of infection on the most affected variety is over 5% of the leaf area. Other pathogens should be recorded when more than 5% of plants are affected. The percentage of plants infected in each plot should be recorded. If disease infection persists, successive records should be made through the season.

D.1.4 Recording methods

Appropriate assessment keys are given in Appendix 8. All disease records to be sent to the Trial Design and Data Handling Operator as soon as they are made.

D.1.5 Inoculated disease tests

No inoculated disease tests are carried out routinely.

Section E – Quality testing procedures

E.1 Responsibilities

E.1.1 The Quality Testing Operator appointed by the Trials Organiser is responsible for conducting approved quality tests according to these procedures.

E.2 Quality assessment methodology

E.2.1 Moisture content determination

The following procedure must be followed;

A 105g sample of seed (± 5 g) is placed in the drier which must be at a temperature of 104°C with the air recirculator set in the range 80-100% recirculation in order to restore the temperature to 104°C as rapidly as possible. When the temperature is restored to 104°C the air regulator is set at 80% recirculation i.e. 20% fresh hot air. The air regulator is critical for even rapid drying. The samples are dried at 104°C for such time as is necessary for complete drying. Each sample is identified with a label.

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.

When all samples from a given trial have been recorded, the fresh and dry weights are immediately reported to the Trials Organiser. When the dry weights are reported as a percentage, the fresh weight should be reported as 100.

Moisture content determination by conductance moisture meter is not acceptable to the Testing Authority.

E.2.2 Oil Content determination

Analysis is performed using continuous emission NMR following ISO 5511:1992. Results are expressed as apparent oil as a percentage at 14% moisture.

The stability of the equipment is checked at two-hourly intervals through the working day by the use of weighed oil standards. A single determination is normally performed on each test sample.

E.2.3 Determination of crude protein or total nitrogen content

E.2.3.1 Hammer milling of grain prior to analysis

The mill must be a hammer mill fitted with a 1mm screen. 300 g of sample are milled, and the material must be totally removed from the receptacle. The sample must be spread thinly, either with a printer's roller or with a wide blade spatula. The sample must be re-formed into a pile and the process repeated four times.

After mixing, a representative sub-sample must be taken in the following manner:-

- A sample jar of 250ml capacity should be filled in small stages re-mixing the bulk between stages and blending each stage within the jar. The sample jar must be filled and then sealed with a close-fitting lid.

E.2.3.2 Determination of crude protein or total nitrogen content

Determination of Crude Protein or Total Nitrogen Content must be by a chemical method, recognised by competent authorities (IBD, AOAC, ISO, etc) and which makes direct measurement of nitrogen content.

Methods acceptable to the Testing Authority are currently total nitrogen determined by the Kjeldahl method and total nitrogen using the Dumas method. These methods are only acceptable where instrumentation used is capable of analysing sample sizes greater than 0.5 g.

Quality assurance of the analytical procedures should include regular analysis of a suitable test material - for example, a sample of flour maintained for that purpose.

Instrument drift in Dumas nitrogen should be controlled by standardisation against a suitable analytical standard (EDTA, Glycine), for which the nitrogen content is known.

Systematic errors in Kjeldahl nitrogen analysis should be controlled by the inclusion of blank analyses and by the analysis of a suitable analytical standard (Ammonium Sulphate, Methionine in a suitable bulking agent) for which the nitrogen content is known.

Section F – Trial design and data handling procedures

F.1 Plan Validation and storage

F.1.1 After the trial has been drilled, the Growing Trial Operator must:

1. Confirm that the trial has been drilled according to plan and provide the sowing date, by returning site data 1 and associated trial sketch to the Trial Design and Data Handling Operator.
2. If any amendments to the plan have been made, return a hard copy of the plan to the Trial Design and Data Handling Operator with any amendments clearly indicated. Alternatively, amendments may be notified electronically with the agreement of the Trial Design and Data Handling Operator.

F.1.2 The Trial Design and Data Handling Operator will check these for statistical validity.

F.2 Data recording

F.2.1 Data are recorded using the methods and characters given in Sections C, D and E.

F.2.2 Site information is recorded for each trial including, for example, data on previous cropping, seed rates, soil details and fertiliser applications.

F.2.3 Details of any agrochemical applications are also recorded and forwarded to the Trials Organiser.

F.3 Data processing

F.3.1 Processing of individual agronomic and disease variates.

F.3.2 A list of the agronomic, yield and disease variates, which may be recorded and processed, are specified in Sections C, D and E. After scrutiny, copies of the results will be returned to the Growing Trial Operator for action as agreed by the Trials Organiser.

F.4 Other Tests and trials

F.4.1 Any additional or alternative designs required for the assessment of additional VCU characters not detailed in Annex B of the MINOR CROPS VCU TRIAL PROTOCOL will be added to these Procedures as and when approved by the NLSC.

Appendix 1 – Approved Trial Organisers/ Operators for soya bean

| Activity | Organisers/Operators responsible |
|--|----------------------------------|
| Trials Organiser | BSPB |
| Seed Handling Operator | Niab |
| Trial Design and Data Handling Operator | Niab |
| Pathology Trials Operator | None |
| Trial Inspection and Technical Validation Operator | BSPB |
| Quality Testing Operator | Niab |
| Data Review and Standard Setting Operator | Niab |

Appendix 2 – Approved seed treatment products

To be advised.

Appendix 3 – Seed despatch deadline dates

VCU seed must be delivered to each Growing Trials Operator/ Seed Handling Operator by:

- 1st February.

Appendix 4 – Growing Trial Operators and trial locations

AX4.1 Growing Trial Operators/Seed Handling Operators

| Growing Trial Operator | Seed Handling Operator (If not Trial Operator) | Location of trial |
|------------------------|---|-------------------|
| Niab | Niab, SHU | Cambridge |

AX4.2 Pathology Trials Operator

None

Appendix 5 – Control varieties for VCU assessments

The control varieties are:

- ES Comandor
- RGT Sigma

Appendix 6 – Dates by which records should be submitted

AX6.1 To Trials Organiser

| Record | Latest date of receipt by Trials Operator |
|--|--|
| Site data part 1 (including site sketch) | Within 1 month of drilling trial |
| Site data part 2 | By the time trial is harvested |
| Plot records (in approved electronic format) | Growing Trial Operator should notify Trials Organiser that trial has been harvested within 2 days of harvest |

AX6.2 Plot records to Data Handling Operator

| Record | Date |
|---|--------------------------------------|
| Plot records should be sent to Data Handling Operator | Within 10 days of record being taken |

AX6.3 Plot samples to Quality Testing Operator

| Samples | Date |
|---|--------------------------|
| Plot samples for quality testing should be sent to Quality Testing Operator | Within 2 days of harvest |

Appendix 7 – Growth Stages of Soya Bean

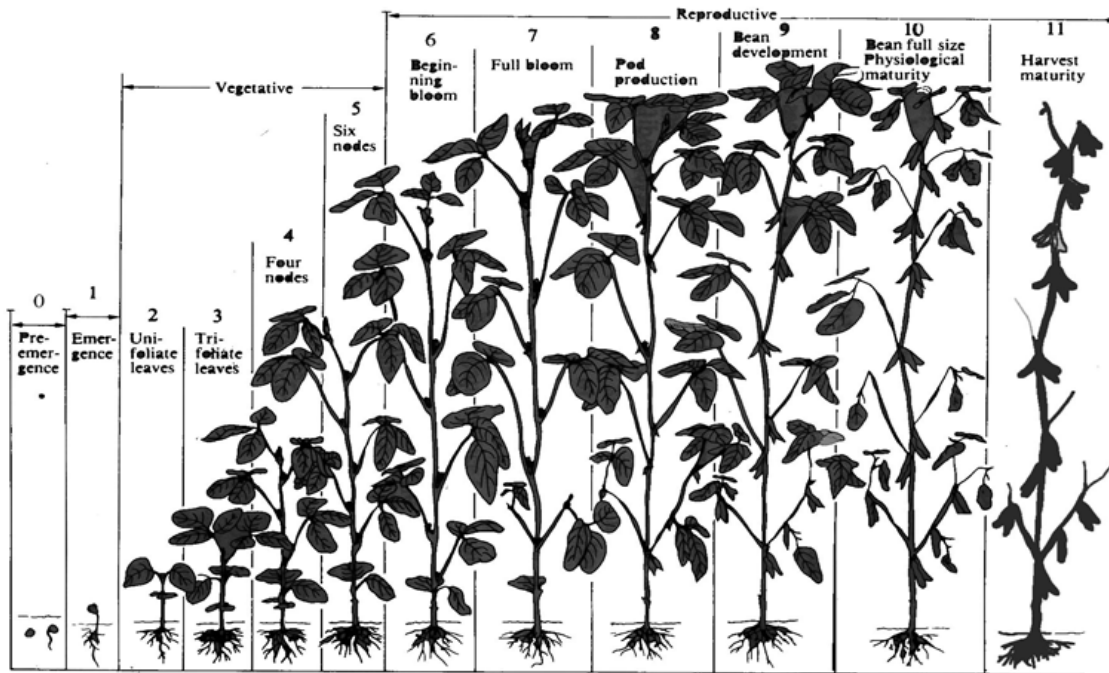


Fig. 8.2 Growth stages of soyabean – Courtesy FAO. Romc.

Appendix 7: Diagram illustrating the growth stages 0 to 11 of soyabean.

Appendix 8 – Assessment of soya bean diseases

AX8.1 Instructions

- 1) Examine all leaves in 3 areas of each plot
- 2) Include all necrosis and chlorosis attributable to disease to be assessed
- 3) Estimate % infection using the description below, interpolating values if necessary
- 4) Record the average % infection from the 3 areas

AX8.2 Infection disease severity description

| Infection | Description |
|-----------|---|
| 0 | No infection observed. |
| 0.1 | Older leaves with a trace of infection, other leaves uninfected. |
| 1 | Older leaves with up to 10% infection, other leaves largely uninfected. |
| 5 | Older leaves with up to 25% infection, middle aged leaves with a trace of infection. |
| 10 | Older and middle-aged leaves with up to 25% infection, young leaves largely uninfected. |
| 25 | Leaves of all ages appear 50% infected 50% green on average. |
| 50 | Leaves of all ages appear more infected than green on average. |
| 75 | Very little green tissues left. |
| 100 | No green tissue left. |



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