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

Linseed – spring and winter

April 2026

Changes since last version (September 2025)

- Updated year of document and date of last update
- Included Appendices in document, updated title and contents to reflect this change
- Updated A.2
    - Updated oil content to additional
- Updated C.6.3.2
- Updated C.6.3.5
- Updated Appendix 5
    - Updated Winter controls
    - Updated Spring controls

Contents

Section A – General Information

A.1 Purpose

A.1.1 This document sets out the approved procedures to be used for growing trials, tests and assessments as required by the current Protocol for Official Examination of Value for Cultivation and Use for Linseed.

A.2 Scope

A.2.1 These procedures apply to all varieties of Linseed.

A.3 Responsibilities

A.3.1 Procedures Developments Group

The Procedures Development Group is responsible for reviewing these procedures annually and making amendments for which it has responsibility, in accordance with the provisions of the VCU Protocol.

A.3.2 Trials Organisers and Operators

A.3.2.1 Trials Organisers

British Society of Plant Breeders Ltd (BSPB)
BSPB House
114 Lancaster Way Business Park
Ely
Cambs. Tel. No.: 01353 653200
CB6 3NX Email: ~~bspb-~~
~~trials~~louise.everest@bspb.co.uk

A.3.2.2 The Trials Organiser is responsible for ensuring all **VCU Protocol** and **Procedures** requirements are followed and liaison with all Operators carrying out trials for National List purposes, including supply of seed and data handling.

A.3.2.3 **Data Handling Operator**

The Data Handling Operator identified by the Trials Organiser is responsible for trial design and data validation in accordance with the **VCU Protocol** and associated **Procedures**.

A.3.2.4 **Growing Trial Operators, Seed Handling Operators and Quality Testing Operators**

The Trials Organiser is responsible for potential Growing Trial Operators and Quality Testing Operators to carry out trials and tests as determined by the Procedures Development annual review in accordance with the **VCU Protocol**, and these **Procedures**. The Trials Organiser is also responsible for finding Seed Handling Operators who are able to carry out seed handling. Seed Handling Operators prepare trial seed for sowing on behalf of any Growing Trial Operator in accordance with the **VCU Protocol** and these **Procedures**.

A.3.2.5 A list of all approved Organisers and Operators is shown in Appendix 1.

A.3.3 VCU Protocol and Procedures non-compliance

A.3.3.1 Where these procedures use the word “must or will’’ for any action then failure to carry out this action will result in non-compliance. Where the word “should” is used for any action then this is the method to be followed unless there are clear reasons not to, which can be justified by the operator as technically sound.

A.3.3.2 The Trials Organiser will forward any reports on **VCU Protocol** or **Procedures** non-compliance to APHA within 1 week of receipt. The Trials Organiser will obtain authorisation from APHA for any actions, including those necessary to remedy non-compliances, which are not within the requirements of the **VCU Protocol**. Such actions must be recorded as a non-compliance. Where emergency action is required and APHA staff are not available (e.g. evenings/weekends) the Trials Organiser should act but report this to APHA at the earliest opportunity. Where GMOs are concerned the arrangements are as detailed in section A.3.4.

A.3.4 Procedures for GM varieties

A.3.4.1 The National Authorities and Trials Organiser will develop procedures for GM varieties if an application for a GM candidate variety is received.

A.3.5 Processing of seed

A.3.5.1 The Trials Organiser is responsible for organising the processing of seed of candidate varieties submitted by the applicant, and seed of control, or other reference varieties, in accordance with the requirements set out in these Procedures and the current VCU Protocol. The Trials Organiser will ensure that any seed treatments or additives are approved for the purpose. Approved products are listed in Appendix 2.

A.3.6 Dispatch of seed

A.3.6.1 The Trials Organiser will arrange for seed to be dispatched by the agreed deadlines to the Growing Trials Operators, and, for authentication to address(es) supplied by APHA. Dates are given in Appendix 3.

A.3.7 Monitoring of Growing Trial Operators and Seed Handling Operators – documentation

A.3.7.1 The Trials Organiser will take any necessary action to enforce deadline dates and quality standards for required documentation.

A.3.7.2 The Trials Organiser will ensure Growing Trial Operators and Seed Handling Operators have access to all current protocols and procedures relevant to them and that they are notified of any amendments.

A.3.8 Seed quantities

A.3.8.1 The Trials Organiser will determine the quantity of seed required for all VCU tests and trials in each annual series, including authentication, and will notify the applicant of quantities and delivery addresses.

A.3.9 Labelling of seed

A.3.9.1 The Trials Organiser is responsible for ensuring all seed is clearly labelled with variety name/breeders' reference and AFP number.

A.3.10 Seed quality

A.3.10.1 Seed submitted for VCU testing should meet the standards for the final generation of seed given in the appropriate seed regulations, in respect of germination, analytical purity and content of other seeds and any other impurities.

A.3.10.2 The seed should be free from pests and diseases, including stem nematode (Dictylenchus spp) and aschochyta.

A.4 Summary of Growing Trials, Tests and Assessments Procedures

A.4.1 The number of trials and site locations are as detailed in Appendix 4.

A.4.2 Control varieties are listed in Appendix 5.

A.4.3 The Trials Organiser is responsible for informing the Growing Trial Operators of the additional characters, which must be recorded as and when requested by applicants, and any samples that may be required for analysis.

Bold = Obligatory
Italics = Additional. Assessed only if requested by the applicant

A.4.4 Winter Linseed

Type of character	Reference	Description of assessment – Obligatory	Description of assessment – Additional (Assessed only if requested by applicant.)
Yield	Section C	**Plot yield**	
Yield	Section C	**Moisture content**	
Impact of environment	Section C	**Standing ability**	*Plant height* *Earliness of flowering* *Maturity*
Resistance to harmful organisms	Section D	None routinely recorded	
Quality characteristics (laboratory tests)	Section E		*Oil content*

A.4.5 Spring Linseed

Type of character	Reference	Description of assessment – Obligatory	Description of assessment – Additional (Assessed only if requested by applicant.)
Yield	Section C	**Plot yield**	
Yield	Section C	**Moisture content**	
Impact of environment	Section C	**Standing ability**	*Plant height* *Earliness of flowering* *Maturity*
Resistance to harmful organisms	Section D	None routinely recorded	
Quality characteristics (laboratory tests)	Section E		*Oil content*

Further measurements

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

- **Sowing date**
- **Harvest date**
- **Plot size**
- **Bird damage**
- **Seed or boll loss**
- **Combine harvester losses**

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 APHA will notify the Seed Handling Operator of the DUS Test Centre to which a 200 g sample of each variety of linseed should be sent for authentication.

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 The trial must be located within a commercial crop to aid management and for spring linseed reduce the risk of flax flea-beetle (FFB) damage. The Trials Organiser should be consulted if this proves impossible or impractical. Previous cropping must be appropriate for a linseed crop to be grown and should have no history of Fusarium wilt or likely herbicide residues that could damage the crop. There should be at least a 3-year (and preferably 5 year) gap between linseed and any other crop susceptible to sclerotinia.

C.2.3 Soil type should be typical of those on which linseed is grown locally. Soil fertility and texture should be uniform across the site. The soil should be as uniform as possible, 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 wild fauna.

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.3 Sowing the trial

Time of sowing is critical for rapid emergence and even establishment and to reduce the risk of damage by FFB. As a guideline, winter linseed trials should be drilled between Mid-September and Mid-October, and spring linseed trials should be drilled between the last week of March and the 3rd week of April when soil temperatures reach 8ºC and conditions are conducive to rapid and even establishment. To reduce FFB losses in spring linseed the drilling of the trial should coincide as closely as possible with that of the host crop of linseed. Seedbeds need to be well prepared but avoid excessive passes, over-consolidation and compacted soil. Prepare and compress the linseed seedbed so that moisture levels are preserved and even (especially on light soils). The trial can then be drilled when conditions are optimum.

Rolling after drilling is usually necessary and beneficial on lighter and stony soils. Heavier soils should be rolled if there is a risk of moisture loss, but it is essential to avoid capping.

Trial Managers must check the emerging crop regularly and, if, necessary, spray for FFB.

C.3.1 Plot size

C.3.1.1 The harvested plot area per variety should be not less than 20 m² per replicate for trials with a minimum of four replications. Plots should 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 inter-plot gap in the range 0.5 m to 0.8 m.

C.3.2 Plant population

C.3.2.1 Winter and spring linseed is sown at a seed rate of 600 seeds per square metre (aiming for plant population of 400 seeds per metre).

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

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

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

$$\text{Seed rate (kg/ha)} = \frac{\text{((Target population x Drilled plot area) x 10,000)}}{\text{(Establishment \% x Germination \%)}}$$

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 seed

Untreated seed must be sent as set out in accordance with the Seed and Fee Notice, directly to the Seed Handling Operator by the deadline set out in Appendix 3.

When drilling, every effort should be made to obtain even emergence.

C.3.4 Trial layout

C.3.4.1 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.3.4.2 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 Trials Organiser.

C.3.4.3 If there is a need to replace a planned variety e.g. if varieties are withdrawn, affected plots must be sown with any of the standard control varieties. Any such replacements must be agreed with the Trials Organiser. The control varieties are listed in Appendix 5.

C.3.5 Drilling

C.3.5.1 Care must be taken with drill settings and drilling speed to ensure satisfactory and uniform establishment and plant population from plot to plot.

Drill at 1.5 - 4cm into moisture in a firm and fine seedbed. In spring linseed, due to the very high risk of damage by flea beetles trial managers are advised to wait until conditions are conducive to good germination and rapid growth. It is also important to ensure that there is no carryover of seed between plots.

C.3.5.2 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.3.5.3 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.3.6 Confirmation of trial layout

C.3.6.1 After full establishment and within two months of sowing (autumn sown trials) or one month of sowing (spring sown trials, 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 the access gates should utilise the navigation platform 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 AHDB Nutrient Management Guide (RB209), the corresponding advisory publications in England, Wales, Scotland and Northern Ireland and past trialling experience.

A typical rate of nitrogen is to use 80-100 kg/ha minimum (including SMN) as follows:

- Heavier soils: 100% in the prepared seedbed or when rows are first visible.
- Lighter soils: 60% when the rows are visible and 40% at early stem extension.

If the risk of the seedbed drying out is high, then it may be appropriate to apply all N to the seedbed even on lighter soils.

Late applications should be avoided as these can delay harvesting.

Trial managers should be aware of other nutrient requirements and should be prepared, if necessary, to apply appropriate treatments.

C.4.3 Herbicides

The herbicides to be used must be discussed with the Trials Organiser.

Chemicals should not be used to which any variety is known to be sensitive. Pre-emergence herbicides should be used, and it should be noted that under certain soil and weather conditions the linseed crop can be intolerant of some approved post-emergence herbicide products. Post-emergence sulfonyl urea products can be damaging and should be avoided.

The following factors should be considered:

Approved pre-emergence herbicides are effective with good (moist) seedbed conditions and with the appropriate application technique (e.g. water volume). Approved post-

emergence herbicides (e.g. Bentazone – Basagran) can be effective against annual dicotyledons.

Post-emergence herbicide applications should be made when all varieties are taller than 15 - 20 cm (but always check the product label for any product variations on this). The risk is greater on light soils (e.g. chalks) and no variety should not be shorter than 10 cm.

Most damage is likely when soils are very dry and/or during extremes of temperature especially very hot conditions.

Experience has shown that the use of Jubilee (Metsulfuron-methyl) can be particularly damaging and should not be used without consulting AHDB/BSPB. Also note that the following products can lead to damage and should be **avoided**:

- Metazachlor e.g. Butisan
- Metazachlor + quimerac e.g. Katamaran
- Napropamide e.g. Devrinol
- Clopyralid + picloram e.g. Galera
- Bifenox e.g. Fox

If use is considered necessary for the success of the trial pay particular attention to restrictions and specific recommendations for use on linseed.

Use the minimum dose of herbicide that will kill the weeds.

C.4.4 Growth regulators

Plant growth regulators should not be used on spring linseed trials.

Up to four (two autumn and two spring) applications of plant growth regulator can be used on winter linseed to manage excessive or rapid growth. All applications should be discussed with the Trials Organiser.

If there is a high risk of severe lodging, applications of plant growth regulator can be used on winter linseed to manage excessive or rapid growth. All applications should be discussed with the Trials Organiser.

C.4.5 Pest and disease control

C.4.5.1 **Pest control**

Adequate measures should be taken to prevent or minimise damage by any pest. In spring linseed FFB, in particular, are likely to be a significant pest during establishment, in winter linseed pigeons can be a particular problem. Trial managers must ensure that adequate pre- and/or post-emergence control measures are taken.

Assessments should be made wherever pest damage occurs since decisions have to be made on the validity of each plot affected.

For seed dressings, see Appendix 2.

C.4.5.2 **Disease control**

Precautions should be taken to prevent disease levels in excess of about 10% leaf area cover, or about 10% of capsules infected, by applying appropriate fungicides according to the available approvals and label recommendations. Any disease which does develop should be recorded as described in Section E. In spring linseed, the diseases which are most likely to be encountered are *Botrytis* spp. and Alternaria spp. in wet seasons, and Powdery Mildew in dry seasons. In winter linseed Mycosphaerella (Pasmo) is important.

C.4.6 Irrigation

If irrigation is required to establish the trial, seek the specific agreement of the Trials Organiser.

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

It is the Trial Manager's responsibility to ensure that plots can be harvested without damaging neighbouring plots and without contamination: plots should be separated adequately as required.

C.5.2 Harvesting method:

C.5.2.1 Trials may be desiccated prior to combining unless there is a reason for not doing so, the control varieties must be at an overall suitable stage of development.

C.5.2.2 Plots should be trimmed to their final length prior to harvesting. The plot dimensions must be measured prior to harvesting. If it is necessary to reduce the size of any plot at harvest give clear details on the yield file. Individual harvested plot lengths should be recorded.

C.5.3 Samples

C.5.3.1 Samples are required from all plots for moisture determination using the oven method and oil content determination. If additional samples are required, they will be

notified to the Growing Trial Operator by the Trials Organiser. All samples should be labelled with the labels provided, giving variety name/breeders reference, AFP number, replicate number and Growing Trial Operator identification number.

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 sample of 200 g sample should be taken in a polythene bag for moisture content and oil content determination. One label should be placed inside the bag, and this sealed by rolling over the top and securing the bags and the second labels with rubber bands.

C.5.3.4 All bagged samples must be kept in good condition at a moisture content and temperature appropriate for long term storage. They should be clearly marked both inside and outside the container/bag.

C.5.3.5 Sample drying should be undertaken using a cold/warm air drier to reduce moisture content to 9% or below.

C.5.3.6 All plot samples must be labelled with the 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 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

6.1 There are four components:

1. **Diary** Field notes of trial status.

2. **Site data part 1*** Including full location details:
   a) map of site location showing nearby settlements and roads,
   b) a sketch showing the layout of trials in the field with access points, and
   c) 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.6.2 Plot records

C.6.2.1 Plot data may be recorded direct onto a data logger using a system approved by the Trials Organiser or recorded on paper then entered and validated onto a computer using an approved system. A system of ensuring that data are recoverable, in the event of loss of original data, must be implemented, e.g. copy and safe storage. Whichever method is used, individual plot data will only be accepted by the appropriate Trial Design and Data Handling Operator in an approved format using the AFP number, variety name and units as listed in Sections C and D.

C.6.2.2 All observations should be checked at the time of recording to identify any unusual plot performance. These observations should be noted by the recorder and any possible causes identified, together with a recommendation for whether the data should remain in the analysis or should be excluded.

C.6.2.3 Plot numbers on record sheets must correspond with the numbering on the field plan.

C.6.2.4 If a character is not recorded or is missing the Growing Trial Operator should indicate in the diary or on the recording sheet the reason why it has been excluded.

C.6.2.5 Where a plot record is missing the Growing Trial Operator should record this in any data file or hard copy medium as a symbol thereby indicating there is no recorded value associated with this plot.

C.6.2.6 Specific plot records should be made as counts or on the scales shown for each character. Only the character names as listed may be used. All records should be returned to the Trial Design and Data Handling Operator as soon as possible after they are completed to trials@ahdb.org.uk.

C.6.2.7 All records must be returned as soon as reasonably possible and when complete for the whole trial. Indicative deadlines are given in Appendix 6. All records must be returned by the final deadlines.

C.6.3 Procedures for recording characters

The following procedures must be followed for measuring all characters to be used in VL decision-making:

C.6.3.1 **PLOT YIELD AND MOISTURE CONTENT (OBLIGATORY) (kg)**

The following information must accompany the yield data:

- The moisture content % of the harvested grain, determined by oven method.
- Plot length: the plot length harvested in metres.
- Plot width: the width of the harvested plot in metres from outer row to outer row plus half of the inter-plot gap on either side. The adjustment for the inter-plot gap should be no greater than 0.8 m. If these are not the same for every plot a separate record must be submitted.
- Growth stage: usually 9.9 at harvest. The Growth Stage Chart for linseed is at Appendix 7.
- Yield (in kilograms): Note clearly any tare weight to be subtracted.

Yield, moisture content, plot length, plot width and harvest date should be sent to the appropriate Trial Design and Data Handling Operator within 5 days of harvesting the trial.

C.6.3.2 **STANDING ABILITY from all plots**

(Winter linseed - OBLIGATORY) (1-9)

(Spring linseed - OBLIGATORY) (1-9)

1 very poor
9 very good

Growing Trials Operators should assess standing ability at a stage that provides good discrimination between varieties and be prepared to repeat the assessment if further lodging develops.

C.6.3.3 *PLANT HEIGHT from all plots* *(ADDITIONAL)* *(cm)*

Record average plot height at the end of flowering before leaning or lodging takes place (if practical take 3 measurements along the length of the plot). If lodging has occurred, choose a representative area of the plot, lift a number of plants against the measuring pole and record an average height.

C.6.3.4 *EARLINESS from all plots* *(ADDITIONAL)* *(1-9)*

1 very late
9 very early

Record when the earliest variety is in full flower and score all varieties relative to this. An assessment on one occasion is normally sufficient. Estimate the date of full flowering for the earliest control variety.

C.6.3.5 MATURITY from all plots

(Spring linseed - ADDITIONAL) *(1-9)*

(Winter linseed - ADDITIONAL) *(1-9)*

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

1 very late
9 very early

Unrepresentative areas of the plot should be avoided when making assessments, for example, localised diseased infections.

C.6.3.6 **SOWING DATE of each trial** **(OBLIGATORY)** **(Day/month/year)**

This is recorded in Part 1 of the Site Information Form.

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

This is recorded in part 2 of the Site Information Form.

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

1 all plants severely damaged
9 no plants damaged

Indicate the cause of damage and, in the Diary section, what action has been taken to minimise further damage.

C.6.3.9 **SEED (or BOLL) LOSS from all plots** **(OBLIGATORY)** **(1-9)**

1 severe seed loss
9 no seed loss

and give an estimation of maximum % seed loss/boll loss.

Record before harvest if serious loss has already occurred. Base scores either on observation of boll loss or counts on the ground. Ensure that combines are set correctly to minimise losses at harvest. Assess any serious combining losses after harvest.

C.6.3.10 **COMBINE LOSSES from all plots (OBLIGATORY) (1-9)**

This must be recorded.

9 = no combine losses. Combine losses should be assessed if the losses are thought sufficient to exclude the yield data from results. Indicate the estimated number of grains lost per m2 for the lowest score given on the 1 to 9 scale.

C.6.3.11 **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 estimated % 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 or on a 1 to 9 scale. Include definitions of 1 to 9 on the scale.

C.6.3.12 **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 tussocks

D.1.1.1 No disease observation tussocks are carried out routinely.

D.2 Naturally occurring disease in VCU growing trials

D.2.1 If disease levels increase to levels more than 5% of the leaf area (or 5% of infected plants as appropriate for the diseases) on the most affected variety a score should be made and sent to the Trials Organiser. Confirmation of the identity of a disease should be obtained from an appropriate plant pathologist if required. If disease infection persists, successive records should be made through the season.

D.2.1.1 The disease most likely to be encountered is Powdery mildew (*Oidium lini*), though both *Alternaria* and *Botrytis* may cause infections on the leaves. Capsules are most likely to be affected by *Alternaria* and *Botrytis*. Stem and whole plant symptoms are most likely to be caused by *Verticillium*, *Sclerotinia*, *Mycosphaerella* (Pasmo disease), *Phoma*, *Fusarium* wilt and other *Fusarium* diseases. *Fusarium* wilt can cause the entire plant to wilt. If recorded, the trial location should not be used again due to long-term persistence in the soil.

D.2.2 Recording methods

D.2.2.1 **Timing of assessments**

A guide to probable assessment times in terms of growth stage is shown in the Table below:

Disease	Seedling/ Vegetative	Flower bud	Flowering	Capsule formation	Pre-maturity
Powdery mildew %	N/A	√	√	√	N/A
Botrytis %	N/A	√	√	√	N/A
Alternaria %	N/A	N/A	√	√	N/A
Fusarium %	√	√	√	√	N/A
Fusarium wilt %	√	N/A	√	N/A	N/A
Verticillium %	N/A	N/A	N/A	√	√
Sclerotinia %	N/A	N/A	√	√	N/A
Phoma %	√	√	√	√	N/A
Mycosphaerella %	√	N/A	N/A	√	√

D.2.2.2 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.

Disease data should be received by 13th August

D.3 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 105 g sample (± 5 g) is 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 air regulator is critical for even rapid drying. The samples are dried at 100°C ±4°C for such time as is necessary for complete drying.

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 electronically using the character names given in Section D.10.3. 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 9% 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.

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 appropriate 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 appropriate 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 A 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 linseed

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

Appendix 2 – Seed treatment products for use on VL trials

The products are:

- Integral Pro

Appendix 3 – Seed despatch deadline dates

VCU seed must be delivered to Niab by:

- VL Winter Linseed — 15th August
- VL Spring Linseed — 15th December
- DL Spring Linseed — Last Wednesday in February

Appendix 4 – Growing Trial Operators and Trial locations

AX4.1 Growing Trial Operators/Seed Handling Operators

AX4.1.1 Winter Linseed

Growing Trial Operator	Seed Handling Operator (if not trial operator)	Location of trial
Niab	Trial Operator	Sutton Scotney, Hampshire
Elsoms Seeds	Niab, SHU	Spalding, Lincolnshire

AX4.1.2 Spring Linseed

Growing Trial Operator	Seed Handling Operator (if not trail operator)	Location of trial
Envirofield	Niab, SHU	Suffolk
Envirofield	Niab, SHU	Circencester, Gloucestershire
Eurofins	Niab, SHU	Wilson, Derbyshire
Elsoms Seeds	Niab, SHU	Pode Hole, Lincolnshire
Elsoms Seeds	Niab, SHU	Spalding, Lincolnshire

AX4.2 Pathology Trials Operator

Pathology Trial Operator	Location of trial
Not applicable	Not applicable

Appendix 5 – Control varieties for VCU assessments

The control varieties are:

Winter linseed

- Odin
- Attila

Spring Linseed

- CDC Rowland
- Abacus
- Bingo

Appendix 6 – Dates by which records should be submitted

AX6.1 To Trials Organiser

Record	Latest date of receipt by Trials Organiser
Site data 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 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 To Data Handling Operator

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

AX6.3 To Quality Testing Operator

Record	Date
Plot samples for quality testing should be sent to the Quality Testing Operator	Within 2 days of harvest

Appendix 7 – Growing stages of Linseed

Main Growth Stage	Growth stage	Description of Growth Stage
Germination and emergence	0.0	Dry seed
Leaf production	1.0	Both cotyledons unfolded and green
Leaf production	1.1	First true leaf emerged
Leaf production	1.2	Second true leaf emerged
Leaf production	1.3 etc	Third true leaf emerged
Stem extension	2.0	No internodes (rosette)
Stem extension	2.5	About five internodes
Flower bud development	3.0	Only leaf buds present
Flower bud development	3.1	Flower buds present but enclosed by leaves
Flower bud development	3.3	Flower buds visible from above ('green bud')
Flower bud development	3.5	Flower buds raised above leaves
Flower bud development	3.6	First flower stalks extending
Flower bud development	3.7	First flower buds yellow ('yellow bud')
Flowering	4.0	First flower opened
Flowering	4.1	10% all buds opened
Flowering	4.3	30% all buds opened
Flowering	4.5	50% all buds opened

Main Growth Stage	Growth stage	Description of Growth Stage
Pod development	5.3	30% potential pods
Pod development	5.5	50% potential pods
Pod development	5.7	70% potential pods
Pod development	5.9	All potential pods
Seed development	6.1	Seeds expanding
Seed development	6.2	Most seeds translucent but full size
Seed development	6.3	Most seeds green
Seed development	6.4	Most seed green-brown mottled
Seed development	6.5	Most seeds brown
Seed development	6.6	Most seed dark brown
Seed development	6.7	Most seed black but soft
Seed development	6.8	Most seed black and hard
Seed development	6.9	All seeds black and hard
Leaf senescence	7.0	No description
Stem senescence	8.1	Most stem green
Stem senescence	8.5	Half stem green
Stem senescence	8.9	Little stem green
Pod senescence	9.1	Most Pods green
Pod senescence	9.5	Half pods green
Pod senescence	9.9	Few pods green

Appendix 8 – Assessment of Linseed diseases

The following key (next page) is suitable for foliar and capsule diseases. For stem diseases such as Sclerotinia, and Verticillium an assessment of the % of stems infected per plot should be made.

AX8.1 Instructions

1) Examine all leaves and capsules in 3 areas of each plot.

2) Ignore all naturally senescent tissue.

3) Include all necrosis and chlorosis attributable to disease.

4) Estimate % infection using the descriptions below. Record the average % infection from the 3 areas. Interpolate values if necessary.

Infection	Observation on Leaves	Observation on Capsules
0	No infection observable	No infection observable
0.1	Trace of infection	Trace of infection
1	Diseased leaves with 1 small lesion; plants with a few scattered lesions	Terminal raceme with a few scattered lesions
5	Leaves appear 1/10 infected; diseased leaves with 2 lesions	Terminal raceme appears 1/10 infected; diseased capsules with 1 or 2 lesions
10	Leaves appear ¼ infected; diseased leaves with few large or many small lesions	Terminal raceme appears ¼ infected; diseased capsules with 2 or more lesions
25	Area appears ½ infected ½ green	Area appears ½ infected ½ green
50	Area appears more infected than green	Area appears more infected than green
75	Very little green tissue left	Very little green tissue left
100	Leaves/capsules dead - no green tissue left	Leaves/capsules dead - no green tissue left

Data Protection:
For information on how we handle personal data visit www.gov.uk and search Animal and Plant Health Agency Personal Information Charter.

This publication is available at www.gov.uk/government/publications

Any enquiries regarding this publication should be sent to us at

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