Animal &
Plant Health
Agency

United Kingdom Variety List Trials: Trial Procedures for Official Examination of Value for Cultivation and Use (VCU) Harvest 2024 spring sown, and Harvest 2025 summer sown

Common Vetch *(Vicia sativa),*

Hairy Vetch *(Vicia villosa)*

September 2023

Contents

Changes

Section A - Summary of VCU Trial Assessments Required

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

Type of character	Reference	Description of assessment
Yield	Section C	**Fresh yield**
Yield	Section C	**Dry matter yield**
Impact of environment	Section C	**Early vigour**
Impact of environment	Section C	**Ground cover**
Impact of environment	Section C	Flowering
Resistance to harmful organisms	Section C	**Ascochyta blight**
Resistance to harmful organisms	Section C	**Root rots**
Quality characteristics	Section E	**Dry matter content**
Quality characteristics	Section E	Crude protein (first and second cuts) **chocolate spot**

Further Measurements

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

Sowing Date

Harvest date

Plot size

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 500 g 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 should follow local best practice.

C.2.3 Soil type should be typical of those on which vetch is grown locally. Soil fertility and texture should be uniform across the site. The soil should be sufficiently uniform to avoid variation in the growth of the trial.

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 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 treatments. Cultivations should follow best local practice.

C.2.6 The frequency, direction and approximate date of all cultivations carried out since the last crop should be recorded in the site details record sheet.

C.3. Sowing the Trial

C.3.1 **Plot Size**

C.3.1.1 Plots must be drilled or broadcast to produce a minimum plot length of 4.5 m after cutting back. Minimum sown width is 0.9 m with a maximum unsown gap between plots of 0.5 m. Minimum harvest plot size is 6.5 m^2. The row number per plot should not be less than 10 rows for drilled plots. Three replicates will be sown.

C.3.2 **Plant population**

C.3.2.1 When sowing, self-cleaning type drills should be used:

Common vetch	50 kg / ha in March/April depending on soil conditions.
Hairy vetch	50 kg / ha in spring or late summer

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 Trials Organiser.

C.3.3.3 Buffer plots may be required in some instances. The Trials Organiser will advise if this is the case.

C.3.3.4 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.3.4 **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 carryover of seed between plots.

C.3.4.2 At least one row of discard should 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 on the drilling plan and reported to the Trials Organiser within one month of emergence.

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 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.

C.4.2 **Fertiliser application**

Fertiliser not permitted without the specific agreement of the Trials Organiser.

C.4.3 **Pathways**

A gap (pathway) at the end of each plot of at least 1m is required.

C.4.4 **Plot assessment**

Plots should be assessed to determine whether they are suitable for harvest. Weak plots may occur due to mechanical or varietal problems. If the problem is considered to be varietal the plots must remain as part of the trial. If the problem is considered to be mechanical the plots should either be treated as missing or as half plots.

Plots affected should be notified to the Trials Organiser at the time of detection

C.4.4.1 **Half plots - Plots with gaps or poor uniformity may occur**

If plots have gaps due to mechanical or agronomic problems, it may be necessary to eliminate the poor area by reducing the plot to a uniform length. Removal must be across all rows - whole rows cannot be discarded. These plots should be measured and pegged at the time of the population counts.

C.4.4.2 **Missing plots - Plots with gaps or poor uniformity may occur**

If plots are weak due to mechanical or agronomic problems throughout their entire length, it may be necessary to make the plots missing. These plots should be pegged and should be entered in subsequent data records with a symbol indicating there is no recorded value associated with this plot (see C.6.2.5). The plots should be clearly indicated when the data is sent to the Trial Design and Data Handling Operator.

C.5. Harvesting

C.5.1 **Timing of harvesting**

C.5.1.1 Date of harvesting will be according to a schedule which will be drawn up by the Growing Trial Operator. Two harvest cuts to be taken, one for main growth and one for regrowth.

C.5.1.2 Plots can be topped over at the discretion of the trials operator in the autumn/winter following sowing to provide a uniform plot canopy. Plots should be trimmed to their final harvest length as described in C.4.4 above. The plot dimensions must be measured prior to harvesting.

C.5.2 **Harvesting method**

C.5.2.1 Plots should be harvested using a specialist grass harvester with a reciprocating-knife cutter bar. The harvested vetch must be weighed either on-board or separately, using an electronic balance graduated to 0.1 kg. All harvested material must be removed from the plot after weighing.

Yield records should be transmitted electronically to the appropriate Data Handling Operator within seven working days of each cut.

C.5.3 Samples

C.5.3.1 A representative sample should be taken from each plot at each cut and dried to assess total dry matter yield.

A fully representative sub-sample of fresh material is accurately weighed, or an accurately recorded catch weight taken. The treatment of samples and the time interval between cutting and weighing should be such that there is no significant moisture loss between the weighing of the plot fresh yield and the weighing of the fresh weight of the sample. The fresh sample is recorded to the nearest 1.0g.

If the plot fresh yield is over 300 g then the sample should be a minimum of 300g. If the whole plot fresh yield is less than 100 g then the yield should be recorded as zero and no sample should be taken. If the whole plot fresh yield is between 100g and 300g then use the whole plot yield as the dry matter sample.

The samples are 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 regulator is critical for rapid drying. The samples are dried for such time as is necessary for complete drying. The dried sample is carefully removed from the drier and as soon as the sample is cool enough for accurate weighing. The dry weight is recorded to the nearest 0.1g.

When the dry weights are reported as a percentage, the fresh weight should be reported as 100.

C.5.3.2 Samples, for protein content testing, should be forwarded immediately to:

Quality Analysis Testing

NIAB

Park Farm

Villa Road

Impington

Histon

CB4 9NZ Tel: 01223 233258

It is important that samples are despatched promptly after harvest. Notification of sample dispatch should be made to the appropriate Trials Organiser at the same time

C.5.4 **Submission of data**

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 data handling operator.

C.5.4.3 All samples should be sent to the 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, recording and inspections

2. Site data part 1, including full location details:

    i) Map of site location - showing nearby settlements and roads;
    ii) Sketch - showing the layout of trials in the field with access points;
    iii) Trial layout - showing plot numbers and variety codes/names.

3. Site data part 2, details of agrochemical applications and irrigation.

4. Plot records and data.

C.6.1.1 An entry in the Diary sheet should be made on every trial 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 measure names and units as listed in Section C.6.3.

C.6.2.2 All observations should be checked at the time of recording to ensure that they lie within acceptable limits for the character recorded. Observations that have been designated as exceptional by the recorder should be identified with a note on the approved data file or hard copy medium describing the possible causes together with a recommendation for their exclusion or inclusion in the trial analysis.

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 must 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 Data Handling Operator as soon as possible after they are completed.

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**

C.6.3.1 The following procedures must be followed for measuring all characters to be used in NL decision-making.

C.6.3.2 **SOWING DATE** **(OBLIGATORY)** **(Day/month/year)**

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

C.6.3.3 **EARLY VIGOUR** **all plots**
(OBLIGATORY) **(1-9)**

1 very thin
9 very thick

C.6.3.4 FLOWERING all plots
(ADDITIONAL) (1-9)

1 very thin
9 very thick

C.6.3.4 **FRESH YIELD from all plots (OBLIGATORY) (kg)**

For each harvest enter the total harvested weight in kg per plot and provide the harvested plot dimensions with the record If the plot lengths or widths are not the same for every plot, a separate record must be submitted.

C.6.3.5 **DRY MATTER WEIGHT from all plots (OBLIGATORY) (kg)**

A detailed procedure for the assessment of dry matter content is given in Section E. Also specify the fresh weight taken for the sample. If the figures are DM% then enter the fresh weight of sample as 100.

C.6.3.6 **GROUND COVER from all plots (OBLIGATORY) (1-9)**

Assess the ground cover of sown species in each plot on a 1 to 9 scale, where 9 is most coverage.

C.6.3.7 **CHOCOLATE SPOT from all plots**
ASCOCHYTA BLIGHT from all plots
ROOT ROTS from all plots
(OBLIGATORY if present) (%)

Record as described in Section D

C.6.3.8 **HARVEST DATES (OBLIGATORY) (Day/month/year)**

Scored following the key given in Appendix 7. Scores should be made 7-14 days after a cold period, to allow for expression of symptoms.

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 or on a 1 to 9 scale. 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 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. (Establishment% x Germination %).

Section D - Disease Testing Procedures

D.1 Assessment of Natural Infection

Recording of disease on the growing trials will be the responsibility of the Growing Trial Operator at the appropriate sites.

D.1.1 **Diseases recorded**

D.1.1.1 No inoculated disease tests are carried out routinely.

D.1.1.2 No Disease Observation Plots are carried out routinely.

D.1.1.3 All disease assessments should be sent to the Data Handling Operator as soon as they are made.

D.1.2 **Naturally occurring disease in VCU growing trials**

D.1.2.1 Foliar disease should be recorded when the level of infection on the most affected variety is over 5% of the leaf area. Percentage leaf area infected on the plot as a whole should be recorded. See Appendix 7.

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. The Growing Trial Operators are responsible for producing representative samples for quality assessment as indicated in Section C.

E.2. Quality Assessment Methodology for Obligatory and Additional Tests

E.2.1 Samples are collected for dry matter and protein analysis as indicated in Section C. Although in some instances all of the sampling and weighing of fresh material may be carried out in the field, it is acceptable for samples to be brought to the laboratory for weighing. If the latter option is followed the representative sample is immediately sealed in a 500-gauge polythene bag and kept out of direct sunlight and as cool as possible until transported to the laboratory. Each sample is identified with a label.

E.2.2 Dried material from the following cuts should be retained for protein analysis. Instructions for milling these samples are given below. Samples from each replicate should be bulked for each variety and milled following oven drying. Samples to be despatched to the Testing Co-ordinator for analysis

E.2.3.1 Milling of dried samples for further quality analysis (see Section C.5.4)

1. The dry matter samples from both replicate plots must be combined and a representative sample taken for milling (sufficient to provide 150 ml of milled material for analysis).
2. The mill must be a hammer mill fitted with a screen with 1.0 mm apertures. Screens must be checked for wear of the inside surface at regular intervals. Frequent use causes the circular 1.0 mm hole to elongate, and when the elongation reaches 1.2 mm the screen must be changed.
3. Samples for milling must be absolutely dry. This can be achieved either by milling immediately after weighing out of the dryer or by re-heating dried samples to 104 °C for 1 hour before milling.
4. The mill must be thoroughly clean before use.
5. The mill must be at maximum speed before the sample is introduced gradually to prevent the mill labouring.
6. All of the sample must be removed from the receptacle and thoroughly mixed. Care must be taken at all stages to prevent the loss of fine powder which is a critical part of the milled sample.
7. After mixing, a representative sub-sample should be taken in the following manner:
    a) If less than 150 ml of milled sample, all of it should be placed in the sample tubs.
    b) If more than 150 ml of milled sample, the tub should be filled with a fully representative sub-sample that has been fully mixed before placing in the tub.
8. The sample tub must be sealed with a close-fitting lid and labelled with information in an approved format.
9. The milled samples must be sent to the laboratory for analysis immediately and by 15th September at the latest, with appropriate identification documentation.

E.2.4 Crude protein analysis

This is evaluated by the Quality Testing Operator using “Dumas Gas Analysis”.

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:

a) 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.

b) 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 and, once this has been done, will load the plan on the database.

F.2. Data Recording

F.2.1 Data is 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, cultivations, 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 D of the **MINOR CROPS VCU TRIAL PROTOCOL** will be added to these **Procedures** as and when approved by the NLSC.

Supporting Document for Appendices

Appendices for this main procedure are stored in a separate document, which is updated closer to the start of the growing trial to include the latest information on controls and trial organisers. This will be published on VCU protocols and procedures for testing agricultural crops - GOV.UK (www.gov.uk).

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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www.gov.uk/apha

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