



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

Forage Triticale

July 2026

Changes since last version (September 2025)

- Included Appendices in document, updated title and contents to reflect this change
- Updated Section A.3.2 - Trial organiser email address and phone number updated
- Updated Section A.4.5 - Lodging is added as a character
- Updated Section C.6.3.5 - Plant Population – count change to 1-9 code=9 no loss
- Removed sections C.6.3.7 and C.6.3.8 on Diseases for recording characters of eyespot and septoria spp
- New Section C.6.3.8 added - Yellow Rust
- Updated Appendix 2 on seed treatment
- Updated Appendix 3 the seed dispatch deadlines changes - to 1 September for Winter Forage Triticale and 10 January for Spring Forage Triticale
- Updated Appendix 7 - Table AX7.2 Brown Rust removed middle column, infections by score and Table AX7.3 added for Yellow Rust
- Updated Appendix 8 Assessment Keys for Cereal Diseases removed table for Crown Rust, Septoria, Net Blotch and Rhynchosporium and Ramularia

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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 Forage Triticale.

A.2 Scope

A.2.1 These procedures apply to all varieties of Forage Triticale.

A.3 Responsibilities

A.3.1 Procedures Development 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 Trial Organisers

a) England and Wales

British Society of Plant Breeders Ltd (BSPB)
BSPB House
114 Lancaster Way Business Park
Ely
Cambs.
CB6 3NX

Tel. No.: 01353 653202
Email: louise.everest@bspb.co.uk

b) Scotland

SASA
Roddinglaw Road
Edinburgh
EH12 9FJ

Tel No: 0131 2448899
Email: seeds@sasa.gov.scot

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 Variety 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 proposing potential Growing Trial Operators and Quality Testing Operators to carry out trials and tests as determined by the Procedures Development Group 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 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 Handling of trial seed

A.3.5.1 The Trials Organiser is responsible for organising the handling 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 fit for the purpose. Seed treatment 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 Trial Operators, and, for authentication, to the DUS testing centres including, where appropriate, foreign testing authorities.

A.3.7 Monitoring of VCU 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 must 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.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.

A.4.4 Special tests

An additional test for characters not specified in the procedures may be requested by the applicant. APHA is responsible for liaison with the Trials Organisers to produce a procedure for the conduct of a special test or trial. This procedure would require the approval of the National Authorities.

A.4.5 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
Resistance to harmful organisms	Section D	Ergot Eyespot Septoria spp Brown rust
Behaviour with respect to factors in the physical environment	Section C	Plant population <i>Early vigour</i> <i>Height</i> <i>Re-growth</i> <i>Hardiness</i> Lodging
Quality characteristics	Section E	Dry matter content

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 For every variety submitted for VCU trialling, the Seed Handling Operator must forward 200 g of untreated sample of seed, 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.2.1.1 Previous cropping should follow local best practice i.e., no forage triticale grown in the previous two years.

C.2.1.2 Soil type should be typical of those on which forage triticale 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.2.1.3 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.2.1.4 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.2.1.5 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 to a greater length than required and then trimmed back to appropriate length prior to harvest. The plot width for calculating the harvested area is measured from outer row to outer row plus half the inter-plot gap on either side. The allowance for the inter-plot gap must be no greater than 0.45m. The plots must be sown at a size sufficient to allow a minimum target harvested plot area, after trimming, of 15 m². There will be a minimum of three replicates sown. Replicates are dependent on the number of varieties to be tested.

C.3.2 Plant population

C.3.2.1 Plots should be sown to achieve a target final uniform plant population of approximately 300-325 plants/m².

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

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

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 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 two rows 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.

C.3.5.2 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.
- 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 and spray application

Applications of fertilisers and sprays should be uniform. It is normally best to apply these across the direction of the plots. The precision application of chemicals post-drilling down the rows is permitted where appropriate, but wheeling's within or between plots post drilling are not acceptable unless they consistently occur in the same place in each plot.

C.4.3 Fertiliser application

Applications of fertilisers 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.4.4 Herbicides

The Trials Organiser must be consulted. Application should be across the direction of drilling.

C.4.5 Pest and disease control

C.4.5.1 Pest control

Appropriate seed dressings must be applied as approved by the Trials Organiser. The chemical seed treatment applied to the trial seed should control some soil-borne pests and may provide some early-season control of insect-borne-virus vectors. However, appropriate pesticide treatments should be undertaken to control virus vectors through the season. Precautions should be taken against attacks by, for example, birds, deer, rabbits, hares, mice, and insects.

C.4.5.2 Disease control

Trials should be treated with a fungicide according to the instructions in Appendix 7.

C.4.6 Irrigation

Irrigation will not be permitted without the specific agreement of the Trials Organiser.

C.4.7 Pathways

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

C.4.8 Plot assessment

Plots should be assessed at the time of the population count 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.4.8.1 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.4.8.2 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 at the time of the population counts 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 (timings to be determined by the trials Officer).

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.4.7 above. The plot dimensions must be measured prior to harvesting. If it is necessary to reduce the harvest size as described in C.4.8.1 above give clear details with the yield file. Individual harvested plot lengths should be recorded.

C.5.2 Harvesting method

C.5.2.1 All trials will be harvested by harvesting equipment approved by the Trials Organiser. There will be two harvest dates, a main cut and regrowth to be determined by the Trials Officer.

C.5.3 Samples

C.5.3.1 A sample of the chopped material (minimum 500 g) should be taken for dry matter analysis from each plot. A composite sample from all rows should be taken. Make every attempt to ensure that the sample is well mixed and representative of the plot.

C.5.3.2 All samples should be labelled with the labels provided by the Trials Organiser.

C.5.3.3 The samples should be delivered to the appropriate Quality Testing Operator as soon as practical after harvest.

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 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.

** Template/Workbook provided by Trials Organiser/coordinator*

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 and on the recording sheet the reason 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 7. 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 VL decision-making.

Bold = Obligatory

Italics = Additional if requested by the applicant

C.6.3.2	SOWING DATE	(OBLIGATORY)	(Day/month/year)
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This is recorded in Part 1 of the Site Information Form.

C.6.3.3 FRESH YIELD from all plots (OBLIGATORY) (kg)

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.6.3.4 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.6.3.5 PLANT POPULATION from all plots (OBLIGATORY) (1-9) 9=no loss

Record the number of plants in the plot after full emergence by using a quadrat. Record the plot length counted and indicate any rows that have a low population.

C.6.3.6	ERGOT	from all plots	(OBLIGATORY if present)	(%)

Record if the most affected variety has over 5% of the leaf area affected using the foliar disease assessment key.

C.6.3.7 **BROWN RUST from all plots (OBLIGATORY if present) (%)**

Record if the most affected variety has over 5% of the leaf area affected using the foliar disease assessment key.

C.6.3.8 **YELLOW RUST from all plots (OBLIGATORY if present) (%)**

Record if the most affected variety has over 5% of the leaf area affected using the foliar disease assessment key.

C.6.3.9 **HARVEST DATE (Main) (OBLIGATORY) (Day/month/year)**
and SECOND DATE (regrowth)

C.6.3.10 *EARLY VIGOUR from all plots (ADDITIONAL) (1-9)*

1 = Stunted, yellow, poorly growing plants

9 = Tall, green, vigorously growing plants

C.6.3.11 *HEIGHT from all plots (ADDITIONAL) (cm)*

Estimate the average canopy height for each plot, when variety has reached full height just before harvest.

C.6.3.12 *WINTER HARDINESS from all plots (ADDITIONAL) (1-9)*

1 = complete loss

9 = no damage

Scored following the key given in Appendix 8. Scores should be made 7-14 days after a cold period, to allow for expression of symptoms.

C.6.3.13 **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.6.3.14 **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:

- Give inspectors reasonable access to trials and provide full location and site details (if not already given with site data 1)
- Provide the inspector with information (for example pesticide sprays applied etc) within seven days of a request.
- Co-operate with the inspector in making any non-routine assessments required to establish the validity of the trial (for example population counts)
- Carry out any action agreed in consultation with the inspector.

Section D – Disease testing procedures

D.1 Assessment of natural infection

D.1.1 The Growing Trial Operator is responsible for carrying out these procedures.

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

D.1.2.1 Naturally occurring disease is normally recorded in the growing trials. Confirmation of the identity of a disease should be obtained from an appropriate plant pathologist if required.

D.1.2.2 **Recording methods**

D.1.2.2.1 Diseases are assessed using the timings and appropriate assessment keys given in Appendix 8. All disease records to be sent to the Trial Design and Data Handling Operator as soon as they are made.

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 Dry Weight determination

(OBLIGATORY)

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.

A fully representative sub-sample (min 500 g) of well-chopped fresh material is accurately weighed, or an accurately recorded catch weight (min 500 g recorded to one decimal place) taken. 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.

The sample is placed in the drier which must be at a temperature of $100\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ with the air re-circulator set in the range 80-100% recirculation in order to restore the temperature to $100\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ as rapidly as possible. When the temperature is restored to $100\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ 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 $100\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ 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.

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 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, 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.

Appendix 1 – Approved Trial Organisers/ Operators for Forage Triticale

Activity	Organisers/Operators responsible
Trials Organiser	BSPB
Trial Design and Data Handling Operator	Niab
Growing Trial Operator	Niab
Seed Handling Operator	Niab
Trial Inspection and Technical Validation Operator	Niab
Quality Testing Operator	Niab
Data Review and Standard Setting Operator	Niab

Appendix 2 – Seed treatment products for use on VL trials

The seed treatment products are:

- Approved products compliant with restrictions, manufacturer's guidance and Trials Organiser's approval.
- Triticale seed shall be treated with Prothioconazole and Tebuconazole (Redigo Pro), or alternatively with Kinto® Plus (Fluxapyroxad, Triticonazole, and Fludioxonil) may be used.

Appendix 3 – Seed despatch deadline

VCU seed must be delivered to the Seed Handler by:

- Winter sown Triticale 1 September
- Spring sown Triticale 10 January

Appendix 4 – VCU Growing Trial Operators and trial locations for Forage Triticale

Growing Trial Operator	Seed Handling Operator (if not trial operator)	Location of trial
Niab	Niab	TBC

Appendix 5 – Control varieties for VCU assessments for Forage Triticale

The control varieties are:

Spring:

- Dublet
- Mazur

Winter:

- KWS Fido
- Amarillo

Appendix 6 – Dates by which records should be submitted

AX6.1 To Trials Organiser

Record	Latest date of receipt by Trials Organiser
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 – Assessment keys for Forage Triticale diseases

Last updated: December 2023

Recommendations by Paul Gosling, BASIS registration number R\E\8107\IFM.

- RL Trials Co-ordinator: AHDB 024 7669 2051
- VL Co-Ordinator: BSPB Trials 01353 653200

This programme is for use on AHDB Recommended List and National List cereal trials in 2021/22:

- For spring and summer applications to trials for harvest 2027
- For autumn applications to trials to be harvested in 2027

It is an experimental protocol and is designed to meet the protocol aim of keeping disease levels in treated plots below 5% infection in all varieties and in all trials. It is not intended to follow commercial practice.

Please note that most treatments are compulsory, and the rates and timings specified should be adhered to as closely as possible. The protocol is robust and, if applied correctly, should be effective. **If, however, disease levels rise above 5% (e.g., if weather conditions do not allow optimal application), please contact Mark Bollebakker (RL) or Louise Everest (VL) to discuss an appropriate course of action.**

Fungicides should be applied at the stated dose rates unless agreed otherwise with the RL Trials Co-ordinator or VL Co-ordinator. Changes to dose rates will only be sanctioned in exceptional circumstances, such as drought-stressed trials under low disease pressure.

Please contact the RL Trials Co-ordinator or VL Co-ordinator if you have any difficulty in sourcing a particular product.

In some cases, two or more products may be available from a company with the same active substances and formulation; if you wish to use such a product and it is not listed in this protocol, contact the RL Trials Co-ordinator or VL Co-ordinator. Generic products should be avoided as they may contain the same active substances but in a different formulation.

Important: Every care has been taken to ensure that all mixtures, rates, and timings are approved, meeting COSHH regulations and manufacturers and statutory guidelines. However, it is the responsibility of the Trial Manager to ensure that they meet all current regulations at the time of application. It is recommended to seek advice from a qualified BASIS advisor for suitability to local conditions and regulatory compliance. The RL Trials

Co-ordinator or VL Co-ordinator should be notified of any conflict between the protocol and current regulations.

In accordance with FRAC guidelines, only two applications of strobilurin fungicides and two SDHI fungicides are to be applied to any crop.

Product	Active substances	Amount of active substance	Manufacturer
Ascra Xpro	Bixafen	65g/l	Bayer Crop Science
	Fluopyram	65g/l	
	Prothioconazole	130g/l	
Comet 200	Pyraclostrobin	200 g/l	BASF
Cyflamid	Cyflufenamid	50 g/l	Certis
Elatus ERA	Benzovindiflupyr	75 g/l	Syngenta
	Prothioconazole	150 g/l	
Entargo	Boscalid	500 g/l	BASF
Arizona	Folpet	500 g/l	Adama
Proline 275	Prothioconazole	275 g/l	Bayer
Prosaro	Prothioconazole	125 g/l	Bayer
	Tebuconazole	125 g/l	
Revystar XE	Mefentrifluconazole Fluxapyroxad	47.5/100 g/l	BASF
Sunorg-Pro	Metconazole	90g/l	BASF
Talius/Justice	Proquinazid	200 g/l	DuPont
Tebucur 250	Tebuconazole	250 g/l	Belchim/Rotam
Univoq	Fenpicoxamid	50 g/l	Corteva
	Prothioconazole	100 g/l	

WINTER TRITICALE

Treatment Timing	Growth Stage (G.S.) - target timing or disease	Product / active ingredient	Rate
T0	G.S. 30		
		Tebuconazole 250 +	0.75 – 1.0 l/ha
	<i>Optional: If mildew present, TRIALS OPERATORS' DISCRETION WHETHER TO USE EITHER AT T0 OR T1.</i>	<i>Cyflamid</i>	<i>0.25 – 0.35 l/ha</i>
T1	G.S. 31 – 32		
	Increase rate for high rust.	Elatus Era +	1.0 l/ha
	<i>Optional: If mildew present, TRIALS OPERATORS' DISCRETION WHETHER TO USE EITHER AT T0 OR T1.</i>	<i>Cyflamid</i>	<i>0.25 – 0.35 l/ha</i>
T2	G.S. 39 – 45		
		Revystar XE	0.5 – 1.0 l/ha
T3	G.S. 59 – 61		
	<i>Optional: Rye only if rust remain a problem before G.S.61.</i>	<i>Prosaro</i>	<i>0.8 l/ha</i>

SPRING TRITICALE

Treatment Timing	Growth Stage (G.S.) - target timing or disease	Product / active ingredient	Rate
T1	G.S. 31 – 32		
		Tebuconazole 250 +	0.75 – 1.0 l/ha
		Talius/Justice	0.15 l/ha
T2	G.S. 32 – 45		
		Elatus Era	1.0 l/ha

AX7.1 Recommended List Fungicide and PGR Ag Chem product labels

AX7.1.1 Introduction

This list can be used to help find the relevant product labels for PGRs, fungicides, herbicides, and insecticides listed in the main protocols. The links below can be used to navigate to the company page and search for the product labels.

Adama UK

[Listen > Learn > Deliver | ADAMA](#)

BASF

[Product Labels, MSDSs & EISs \(basf.co.uk\)](#)

Bayer Crop Science

[Crop Protection Products from Bayer Crop Science UK](#)

Belchim UK

[Products UK – Belchim Crop Protection](#)

Certis Europe

[Products A-Z and Key Documents | Certis Europe United Kingdom](#)

Corteva/DU Pont

[Find a Product | Corteva Agriscience](#)

Syngenta

[Labels and SDS downloads | Syngenta](#)

AX7.2 Brown rust

% Infection	Amount of infection
0	No infection observed
0.1	1 small cluster of pustules per tiller
1	1 cluster per leaf
5	Most tillers infected but some top leaves uninfected
10	All leaves infected but leaves appear green overall
25	Leaves appear ½ infected ½ green
50	Leaves appear more infected than green
75	Very little green leaf tissue left
100	Leaves dead - no green tissue left

AX7.3 Yellow rust

% Infection	Amount of infection
0	No infection observed
0.1	1 small cluster of pustules per tiller
1	1 cluster per leaf
5	Most tillers infected but some top leaves uninfected
10	All leaves infected but leaves appear green overall

25	Leaves appear ½ infected ½ green
50	Leaves appear more infected than green
75	Very little green leaf tissue left
100	Leaves dead - no green tissue left

Appendix 8 – Assessment keys for cereal diseases

- 1) Examine top 4 leaves. If top leaf has been fully expanded for less than 14 days, refer to 2nd leaf as 'top leaf'.
- 2) Ignore all naturally senescent leaf tissue.
- 3) Include all chlorosis and necrosis attributable to disease.
- 4) Record % infection; use interpolated values (e.g. 3%) if necessary.

If foci present, record average over the plot as a whole.

% Infection	Yellow rust		Brown rust
0	No infection observed		
0.1	1 small cluster of pustules per tiller	1 stripes per tiller	25 pustules per tiller
1	1 cluster per leaf	2 stripes per leaf	100 pustules per leaf
5	Most tillers infected but some top leaves uninfected	Most tillers infected but some top leaves uninfected	Top leaf – numerous pustules but leaves appear green overall
10	All leaves infected but leaves appear green overall	All leaves infected but leaves appear green overall	Top leaf – pustules sufficiently dense to give brown appearance in patches
25	Leaves appear ½ infected ½ green		
50	Leaves appear more infected than green		
75	Very little green leaf tissue left		
100	Leaves dead - no green tissue left		

% Infection	Rhynchosporium
0	No infection observed
0.1	1 lesion per 10 tillers
1	1 lesion per tiller
5	Discrete lesions on most tillers, about 2 per leaf
10	Lesions coalescing but leaves appear green overall
25	Leaves appear ½ infected ½ green
50	Leaves appear more infected than green
75	Very little green leaf tissue left
100	Leaves dead - no green tissue left

% Infection	Mildew
0	
0.1	3 pustules per tiller
1	5 pustules per leaf
5	2 lower leaves appear $\frac{1}{4}$ infected
10	2 lower leaves appear $\frac{1}{2}$ infected
25	Leaves appear $\frac{1}{2}$ infected $\frac{1}{2}$ green
50	Leaves appear more infected than green
75	Very little green leaf tissue left
100	Leaves dead - no green tissue left



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webmaster@apha.gov.uk

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