

## RECOMMENDED LISTS

### **AHDB Recommended Lists (RL) for cereals and oilseeds: Cereal Trials protocols (2022–26)**

This protocol was believed to comply with relevant agrochemical, environmental and other regulations at the time of writing but it is the responsibility of the contractor to ensure that it continues to comply. In the event of non-compliance, the protocol should not be followed but the Field Trials Manager should be notified at once of how the protocol requirements would breach regulations.

Any deviation from this protocol other than under the circumstances described above may result in a breach of contract and should be agreed in advance.

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## Changes from previous version

Page no.	Section	Details of change
Throughout		Clarification of job titles and key contacts
8	1.4.1	Updated sowing dates
8	1.4.2	Removal of autumn sown spring wheat trial specification. No longer running yielded trials.
9	1.4.5	Amended WO trial specifications
11	2.1.1	“Knowledge Transfer” amended to “Knowledge Exchange”
12	2.2	Amended randomisation of trials
15	2.5.1	Target population for hybrid varieties added
16	2.6.1	“Fertiliser Manual” amended to “AHDB Nutrient Management Guide”
16	2.6.3	Amended contact details
17	2.6.5	“Fertiliser Manual” amended to “AHDB Nutrient Management Guide”
		Amended trial sites
		Amended feed management
19	2.6.7	Additional guidance of control of wheat blossom midge
		“is an increasing problem” amended to “can be an issue”
20	2.7	Clarification on additional recording columns
21	2.7.2	Clarification on how to detail changes to trial plans
21	2.7.3	Section added: Early data
22	2.7.4	Section added: Disease data
		Clarification to low disease level assessments
22	2.7.5	Amended harvest data requirements
22	2.7.6	Amended re-rand macro guidance
24	2.7.6	Amended straw length character and sites required from
26	2.7.6	Amended ear loss – “trial operator to provide assessment key”
27	2.7.6	Amended combine losses – “trial operator to provide assessment key”
		Amended harvest date requirements
28	2.7.7	Additional guidance for disease diagnosis
28	2.7.7	Amended net blotch scoring
29	2.7.7	Additional diseases to be scored
30	2.7.7	Reference to 1-9 scale deleted, recording to be as a percentage
31	2.7.7	Amended disease names
31	2.7.7	Section added: Yellow rust assessments

31	2.7.7	Amended link to UKCVPS website and updated contact details
32	2.7.7	Section added: Disease assessment training
36-45	Appendix 1	Fungicide protocol moved to Protocol 201
46-51	Appendix 2	PGR protocol moved to Protocol 202

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## **Part 1: General information**

### **1.1 Trial sites**

The list of trials and the specification to which they should be grown is found in Appendix 9.

For winter wheat, winter barley and spring barley, individual trials may be specified to be grown for specific end uses e.g. bread-making, biscuit-making, malt for brewing, malt for distilling or for feed. If the intended trial end use is not specified, the contractor should agree the intended end-use with the Field Trials Managers Team before drilling.

### **1.2 Description of trial types**

Core sites have two yield trials, one with and one without fungicide treatment (i.e. +F & –F). Plant growth regulator (PGR) applications are specific to individual crops; where applied, PGR treatment should be the same for both +F and –F trials.

Regional sites have three replications and are fungicide treated. PGR treatments are specific to individual crops. These trials will normally have one replication of Disease Observation Plots (DOPs, see below), which should receive the same PGR treatment as the associated +F yield trial.

Some sites may also have two replication lodging trials (managed to promote lodging in weaker stemmed varieties but not taken to yield; see below).

#### ***Disease Observation Plots (DOPs)***

These trials should receive no fungicide but the PGR programme should be as for the associated treated trial. DOPs are not taken to yield. They can be whole plots, short plots or untreated ends of plots (by prior arrangement - minimum length four metres). If using the ends of plots (strips) then replication one of the yield trial should be used for DOPs - contact the Field Trials Managers Team if this is not possible. Extra care should be taken to avoid fungicide spray drift from adjacent plots and records should be made at the end furthest from any fungicide treated area. These plots may include special disease resistant or susceptible varieties as comparators to assist with the derivation of ratings and may be used as part of AHDB monitoring activities, requiring regular assessments.

#### ***Lodging trials***

These trials should receive a full fungicide programme but no PGR. Husbandry and management, such as nitrogen top dressing, should be adjusted if necessary to try to induce lodging in weaker strawed varieties and thus will be different to the neighbouring yield plots. The trials are not taken to yield. Observations can be made on whole plots, short plots or untreated ends of plots (by prior arrangement - minimum length four metres). If using the ends of plots (strips) then replications two and three of the yield trial should be used for lodging plots - contact the Field Trials Managers Team if this is not possible. Extra care should be taken to avoid spray drift from adjacent plots and records should be made at the end furthest from any PGR treated areas.

### 1.3 Soil type definitions

Descriptor	Soil type	Definition
<b>L</b>	Light sand soils	Soils which are sand, loamy sand or sandy loam to 40 cm depth and are sand or loamy sand between 40 and 80 cm, or over sandstone rock.
	Shallow	Soils over chalk, limestone or other rock where the parent material is within 40 cm of the soil surface. Sandy soils developed over sandstone rock should be regarded as light sand soils.
<b>M</b>	Medium	Medium textured soil that does not fall into other category.
<b>H</b>	Deep clay soils	Soils with predominantly sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay or clay topsoil overlying clay subsoil. Deep clay soils normally need artificial field drainage.
	Deep fertile soils	Soils of sandy silt loam, silt loam to silty clay loam textures to 100 cm depth or more. Silt soils formed on marine alluvium; warp soils (formed on river alluvium) and brickearth soils (formed on windblown material) will be in this category.
<b>O</b>	Organic soils	Soils that are predominantly mineral with between 6 and 20% organic matter. These can be distinguished by darker colouring that stains the fingers black or grey and gives the soil a silty feel.
	Peaty soils	Soils that contain more than 20% organic matter derived from sedge or similar peat material.
<b>C (L)</b>	Chalky soil.	Specific chalky soil within the L group described above.
<b>B (L)</b>	Limestone brash soil.	Specific limestone brash within the L group described above.
<b>W (L)</b>	Wold	Wold soil over chalk within the L group described above.
<b>F (O)</b>	Black Fen soil.	Black fen within the O group described above.
<b>S (H)</b>	Silts	Silty soils that are within the H group described above.

### 1.4 Trial specifications

See RL Trials specifications H2022–H2026 for the full list of trials and specifications.

#### 1.4.1 Trial specifications for wheat trials sown in the autumn/winter

Where specified wheat trials will have the following rotational position:

- 1 First wheat crop after a non-cereal break crop, oats or fallow.
- 2 Second or later cereal crop excluding oats.

### ***Sowing date***

- |   |   |
|---|---|
| E | Early sown winter wheat: To be sown as soon as seed availability allows (usually from 17 <sup>th</sup> September) and before the 25 <sup>th</sup> September. Contact the Field Trials Managers Team if sowing is not possible before the 25 <sup>th</sup> September. There is also a series of trials for very early sowing (25 <sup>th</sup> August to 14 <sup>th</sup> September) which are covered by a separate protocol. |
| M | Medium sown winter wheat: To be sown between the 25 <sup>th</sup> Sept to 1 <sup>st</sup> November.   |
| L | Late-sown winter wheat: To be sown between the 1 <sup>st</sup> November to 31 <sup>st</sup> January.  |

### **1.4.2 Trial specifications for spring sown spring wheat**

Sowing should be in the spring and after the beginning of February. Contact the Field Trials Managers Team if sowing has not taken place by the end of March, but do not miss an opportunity to sow whilst waiting for a reply. Where defined, rotational position should be as described for winter wheat above. In some trials, Recommended List varieties are grown together with National List varieties and the data analysed by BioSS. Combined RL/NL trials should follow the VCU protocol.

### **1.4.3 Trial specifications for winter barley**

#### ***End use specification***

- |      |   |
|------|---|
| Malt | Trial to be grown to produce 1.65% to 1.8% grain nitrogen with maximum yield. |
| Feed | Grown to produce the maximum yield for feed.                                  |

### ***Sowing date***

To be sown within a few days of the host farm crop. The Field Trials Managers Team should be contacted if soil/weather conditions make this impossible.

### ***Rotational position***

As host farm crop.



#### **1.4.4 Trial specifications for spring barley**

##### ***End use Specification***

- |       |   |
|-------|---|
| M - D | Trial to be grown to produce quality samples for malt distilling. Target grain nitrogen is 1.45% to 1.6% with maximum yield.          |
| M - B | Trial to be grown to produce quality malt samples for export and brewing. Target grain nitrogen is 1.65% to 1.75% with maximum yield. |
| Feed  | Grown to produce the maximum yield for feed.  |

##### ***Sowing date***

To be sown within a few days of the host farm crop. The Field Trials Managers Team should be contacted if soil/weather conditions make this impossible and if the trial has not been sown by the end of April.

##### ***Rotational position***

As the host farm crop.

#### **1.4.5 Trial specifications for winter oats**

Two trials: one three replicate +F with PGR and one two replicate -F with PGR, both taken to yield. Some locations will also have a two replicate lodging trial which is not taken to yield. In some trials, Recommended List varieties are grown together with National List varieties in combined RL/NL trials and the data analysed by BioSS. Combined RL/NL trials should follow the VCU protocol.

#### **1.4.6 Trial specifications for spring oats**

Two trials, each with three replications: +F and -F, both taken to yield. PGR may be applied to the +F trial only if there is a high risk of severe lodging. In some trials, Recommended List varieties are grown together with National List ones and the data analysed by BioSS.

#### **1.4.7 Trial specifications for winter triticale**

Trials are fungicide treated but an extra, untreated single replicate DOP should be sown for disease assessment.

Note that Recommended List, National List and Common Catalogue varieties may be grown in these trials and the data analysed by AHDB.

#### **1.4.8 Trial specifications for winter rye**

Trials are fungicide treated but an extra, untreated single replicate DOP should be sown for disease assessment.

Note that Recommended List, National List and Common Catalogue varieties may be grown in these trials and the data analysed by AHDB.

### **1.5 Trial design and treatments**

Trial plans will be generated by the RL Data Team and transferred to the appropriate trial centres in electronic format as Excel workbooks (one for each trial).

#### ***Replication***

Yield trials will normally have three replications, DOPs one replication and lodging trials two replications. The plot order for the DOPs will normally be the same as that in replication one of the associated treated yield trial and the order of the lodging plots will be the same as replication two and three of the treated trial.

#### ***Fungicide and plant growth regulator (PGR)***

Treatments are to be applied to specified trials as described under each crop specification above and/or in Protocol 201 (Fungicides) and Protocol 202 (PGRs).

The protocols are updated annually (usually December/January) and issued separately. The correct fungicide and PGR programmes must be used; they form part of the trial contract and may constitute a breach of the contract if not adhered to and it is the responsibility of the trial manager to ensure they are using the correct protocols.

Under certain circumstances the trial manager may consider it to be inadvisable to apply individual treatments (e.g. if plants are showing symptoms of stress and their use may have a deleterious effect on yield) but a decision not to treat should be made only after consultation with the Field Trials Managers Team.

## **Part 2: The Trials System**

### **2.1 General**

The trial operator will be responsible for the choice of site, and for the establishment, supervision, recording and harvesting of the trial. There are no GM varieties in Recommended List trials and RL trials must not be grown adjacent to any trial or crop containing genetically modified (GM) plants without the express permission of the RL Project Consortium. Trials should also not be grown on or close to land previously used for GM trials.

Any decision to abandon the trial must be taken in consultation with the Field Trials Managers Team. Payment for trials that are abandoned or rejected may be reduced to reflect the amount of work carried out prior to that point and/or the reason for the loss. See Appendix 10.

In principle, the husbandry of the trial should be appropriate to achieve highest quality and yield. All records should be clear and self-explanatory so that the trial can be carried on by another manager without difficulty.

The seed has been supplied for AHDB Recommended List trial purposes only and must not be used for further multiplication or any purpose other than that specified by the RL Project Consortium, unless special prior permission has been obtained. It is the responsibility of the trial operator to ensure that this does not occur.

#### **2.1.1 Knowledge Exchange (KE)**

It is AHDB's desire that full use of RL trials is made for the benefit of levy-payers. By prior arrangement with AHDB and subject to certain conditions, the use of the trials for KE field events and demonstrations will be encouraged and may be supported. Trial managers must obtain permission to use the trial for any KE or other activities outside of the protocol and in order for the necessary permissions to be sought, applications must be made by email via the RL Team ([trials@ahdb.org.uk](mailto:trials@ahdb.org.uk)) at least three months prior to the event. AHDB will develop guidelines for joint events and events managed by third parties.

#### **2.1.2 Access to trials**

Access to trials by AHDB personnel for trial inspections is covered in section [2.9](#). AHDB may appoint third-parties to conduct assessments on their behalf, for which access to the trial will be required. For reasons of security, health and safety, AHDB will contact the operator prior to such visits taking place event. AHDB will develop guidelines for joint events and events managed by third parties.

## **2.2 Randomisation of trials**

In an incomplete block design, any splitting within superblocks must ensure that blocks stay complete. Any movement of varieties to avoid clustering must be within sub-blocks and not between them. If there are any problems with the plan or in adjusting it to fit into the field, the RL Data Team should be consulted.

If the trial has not been sown to plan confirmation of the changes must be received clearly marked on the trial layout. A new workbook is likely to be issued to you with updated data tabs to reflect these changes and prevent confusion at time of data submission.

## **2.3 Plot dimensions, discards and surround**

It is essential that the plot size suits the intended plot equipment, and contractors should discuss their plans with the Field Trials Manager prior to drilling to ensure that this is the case.

Plots should have a minimum drilled width of 1.1 m (row width \* number of rows) and an inter-plot gap of a maximum 0.55 m to give a total width of not less than 1.65 m.

Plot length should be not less than 9.0 m after trimming back for harvest but may have to be longer depending on the harvesting equipment available.

In winter barley and winter oats, the space between each replication/block should be such that early maturing varieties may be harvested without damaging neighbouring plots. This may be necessary especially where there are large maturity differences between varieties. The RL Data Team may design the trial so that early varieties are grown together.

For all other crops, the space between replications/blocks and plots should be such that individual treatments (e.g. untreated) may be harvested without damaging neighbouring plots. This may be necessary especially where there are large maturity differences between treatments.

Where significant height or maturity differences exist between varieties (e.g. semi-dwarf oat varieties) buffer plots may be required such that a short variety is sown in buffer plots between a yielded plot of a short variety (or group of short varieties) and taller varieties with the block of taller varieties also buffered by plots of similar height. Where possible, use the same variety for the buffer as its neighbouring yield plots (i.e. if variety A is the last yield plot in the dwarf block, also use variety A as the buffer). If this is not possible another variety of the same kind can be used: contact the Field Trials Manager if necessary. See diagram below.

## Buffer plots example



At least one discard plot should be sown on the outside edge of the trial.

The trials manager must ensure that there is no drift of fungicide or PGR onto plots that should be untreated.

There must be at least a 1.5 m gap or pathway from the end of one plot to the beginning of the next plot in the line (i.e. in the next bank of plots).

Where trials with different management systems are grown side-by-side, for example a T and U trial, there should be sufficient space to ensure that there is no drift of fungicide or PGR. When spraying by machine, three discard plots (the first sprayed) are to be drilled. When spraying by hand up and down the plots, at least two discard plots (one sprayed and one unsprayed) are to be drilled.

All plots should be measured for length before harvest.

## 2.4 Trial seed

### Seed standards

Seed for trials will usually be equivalent to certified seed of first generation (C1) or basic seed. The seed supplier must advise the Field Trials Manager if over-year seed is being supplied. Only seed received without chemical seed dressing will be accepted for trials. A note of the thousand seed weight and germination percentage of the seed lot should accompany the seed.

Seed should be supplied to the seed processor specified by the Field Trials Manager. In order to meet requirements for early sowing, it is essential that seed is supplied by deadlines specified in the seed order. Seed received after these deadlines may be omitted from trials.

***Supply of seed to trial operators:***

Seed supplied by the RL Project Consortium should be used only for trials and tests specified by them.

The seed will be treated with a standard seed dressing to give protection against seed-borne disease. An insecticide dressing may also be applied where appropriate. Full details of the chemical treatment will accompany the seed. Variety names, codes, thousand seed weight and germination information will be sent to trial managers, usually by e-mail.

Bulks of seed sufficient to sow the specified trials will be sent to trial managers. It is the responsibility of each trial manager to prepare plot packets from the bulk of seed supplied and to ensure that the correct plant population is achieved (see [2.5.1](#)).

The Field Trials Manager may request the return of surplus seed of some varieties. Any other surplus seed may be used for discard and buffer plots or filling in but for no other purpose without the prior consent of the Field Trials Manager.

Note that in oats, special plots are required for the setting of the combine (see husbandry guidelines, section [2.6.9](#)).

It is the responsibility of individual trial operators to obtain seed for the area immediately surrounding the trial.

## 2.5 Drilling

The amount of seed sown per plot must be adjusted according to the thousand seed weight and germination for each individual seed lot.

### 2.5.1 Target populations

The following table gives the target population in plants per m<sup>2</sup>. These are the final (spring) plant population per m<sup>2</sup> after any losses due to poor germination or establishment. It is the responsibility of the trial manager to decide the seed rate required to achieve these target populations. The target population for hybrid varieties will be 70% of that for non-hybrid varieties.

	Population plants/m <sup>2</sup>	
Crop	England, Wales and N. Ireland	Scotland
Winter wheat	*September sowings: 200 (hybrids 140) *October sowings: 250 (hybrids 175) Nov/Dec sowings: 300 (hybrids 210)	
Winter barley	275 (hybrids 193)	320 (hybrids 225)
Winter oats	275	320–350
Spring wheat (spring sown)	320	-
Spring barley	300–325	300–350
Spring oats	300–325	300–350
Triticale	300–325	300–350
Rye	300–325 (hybrids 210–230)	300–350 (hybrids 210–245)

\* If drilling is delayed more than 2 weeks outside of the drilling window then the trial should be repackaged to provide the higher target population.

### 2.5.2 Seed rate calculation

Experience has shown that in many situations the following establishment assumptions are appropriate:

Winter wheat, barley and oats	90%
Spring sown trials	90%

However, establishment may be higher or lower than this depending on factors such as time of sowing, soil type and weather conditions. Trial operators should use an establishment figure that they feel is appropriate to their situation.

The following formulae may be used to calculate the amount of seed to be sown:

Weight of seed per plot = Seed rate (kg/ha) x Drilled plot area / 10

Seed rate (kg/ha) = ((target population \* thousand seed weight) \* 100) / (establishment % \* germination %)

Drilled plot area = drilled plot length (m) x drilled plot width (number of drilled rows x inter row dimension (m))

## **2.6 Husbandry guidelines**

### **2.6.1 Site Selection**

This should deliver a site to the required specification. Care should be taken in the selection of the site, which should be well away from headlands and trees and not be on land that could be affected by sources of variability such as old farmyard manure heaps. It should have a uniform soil slope and drainage and be free from perennial weeds. The trial must not be located on land that was used for field trials in the previous 12 months. Applications of fertilisers and sprays must be uniform and should be applied across the direction of the plots.

When a site has been selected the pH should be checked under dry conditions and the soil type identified using the AHDB Nutrient Management Guide (RB209 or equivalent) guidelines.

It is essential to have free access to the trial by authorised personnel and equipment at all times including at harvest, even if the surrounding host farm crop is not ripe.

### **2.6.2 Timing of sowing**

Target sowing dates are given for some trials in the trial specification. Where specified it is important that these times are achieved, particularly for early sown trials. If it proves impossible to sow in the target window the Field Trials Managers Team should be consulted, but do not miss a sowing opportunity while waiting for a reply. The Field Trials Manager will expect to receive documentary evidence of why a sowing window was missed.

### **2.6.3 Herbicides**

Chemicals should not be used to which any variety is known to be sensitive. If in doubt, the Field Trials Managers Team should be consulted (see contact details on the AHDB extranet).

### **2.6.4 Fungicides**

Fungicides should only be applied to those trials designed for fungicide treatments. The fungicide protocol is reviewed annually and usually circulated at the beginning of the calendar year (the protocol for use until January 2024 is given in Protocol 201). The schedules comprise a core of 'compulsory' and 'optional' applications. All compulsory applications should be made at the prescribed growth stage and dose rate, irrespective of disease levels in the trial. The optional applications are available if required.

In exceptional circumstances it may be necessary to deviate from the programme, e.g. reduced rates may be required for drought stressed trials under low disease pressure. The Field Trials Managers Team must be notified before taking such a decision and given at least one working day to respond.



## 2.6.5 Fertilisers

Fertiliser applications should take into account inherent fertility, previous cropping, winter rainfall, best local practice and advisory guidelines (e.g. the AHDB Nutrient Management Guide (RB209) or equivalent). Care should be taken to provide adequate P, K and S, taking into account local circumstances. Nitrogen applications should be tailored to give maximum yield within the constraints of obtaining the appropriate grain protein contents for intended use e.g. bread-making or malting. In England and Wales PLANET software is a useful tool for determining the nutrient requirements of individual fields. See [www.planet4farmers.co.uk](http://www.planet4farmers.co.uk).

### ***Winter wheat and spring wheat***

Five winter wheat trials are pre-selected to be managed as a bread-making crop and three for biscuit-making. These trials should be managed accordingly, i.e. trials operators at bread-making sites should aim to produce samples with grain protein content of 13% or more whereas at biscuit-making sites the target is around 11–11.5%. In most circumstances an application of sulphur in early spring would be beneficial. Samples will be taken from these sites and held in reserve if required for milling and baking tests.

Bread sites: 512, 520, 521, 523 and 524

Biscuit sites: 506, 508, 514 and 519

In order to boost grain protein content at the bread-making sites only, an additional 80 kg/ha of nitrogen should be applied at GS37 for granular nitrogen or up to GS73 for foliar urea. It should be applied unless agreed to the contrary with the Field Trials Manager. This late application is not required for other sites.

### ***Winter barley and spring barley***

#### Malting management

A sub-set of trials are designated as malting trials and should be grown under an appropriate nitrogen regime. The timing and rates of application of nitrogen fertiliser to malting barley is critical and trials operators should consult advisory publications and advisors in order to attain the best yield whilst producing the best possible samples for the assessment of malting quality. Early N application is advisable - by mid-March for winter barley and by the three leaf stage (GS13) for spring barley (application to the seedbed is commonly practised for spring barley). To delay beyond these timings may increase grain nitrogen to unacceptable levels.

Winter barley malting (brewing) trials: 603, 608, 609, 610 and 613

Spring barley malting (brewing) trials: 652, 660, 661, 663, 665 and 675

Spring barley malting (distilling) trials: 653, 655, 656, 664, 670 and 671

Trial 657 may be managed for either brewing or distilling.

## Feed management

The remaining winter barley trials and a sub-set of spring barley trials (see list below) are designated as 'feed' and the application of nitrogen should be the optimum for yield and physical grain quality.

Applications to winter barley feed trials should be split into two or (preferably) three timings:

Application 1: 30% of total N\* at GS24–26 (mid-tillering)

Application 2: 50% of total N\* 3–4 weeks after application 1 (around GS31).

Application 3: 20% of total N\* 3–4 weeks after application 2 (around GS32–33).

In the event of only two applications being possible, apply 60% at or before GS31.

\*The total amount of N applied should be based on advisory guidelines.

Spring barley feed trials: 654, 662, 666, 667 and 669.

The remaining spring barley trials are to be grown to local practice.

## Disease Observation Plots (DOPs)

These should be managed to create high disease levels and N fertiliser inputs may be increased if it is necessary to achieve this.

## Lodging trials

These should be managed (by adjusting the N applied) such that varieties with weaker straw will lodge.

### **2.6.6 Plant Growth Regulators (PGR)**

The PGR protocol is reviewed annually and circulated at the beginning of the calendar year (the protocol for use until January 2024 is given in Protocol 202). There are restrictions on the use of Plant Growth Regulators in all crops, as well as special directions for their use specifically in variety trials. The manufacturer's instructions should be followed. Any departure from the protocol should be reported to the Field Trials Managers Team.

### **2.6.7 Pest control**

If the trial is in jeopardy, effective control measures e.g. netting, insecticides, molluscicides must be applied to the whole trial.

#### ***Wheat blossom midges***

Wheat blossom midges seek plants that are at specific growth stages and, for this reason, the validity of wheat variety trials can quickly be compromised by relatively low numbers of the pest. Trial operators should use commercially available traps and/or monitor in the early evening during the critical period between ear emergence and anthesis to detect the activity of egg-laying adults. Trial operators should use the professional monitoring and risk assessment services that are available and seek advice on methods of control. Trial operators must ensure that wheat variety trials are monitored for orange wheat blossom midge, even if the surrounding field crop is drilled with a variety that is resistant to orange wheat blossom midge.

#### ***Gout fly***

Gout fly can be an issue (especially for early-sown trials) and the risk of attack should be assessed and insurance treatments made if the risk is judged to be high.

### **2.6.8 Pre-harvest desiccation**

Pre-harvest desiccation should not normally be used. In exceptional circumstances and on a case-by-case basis, desiccation may be allowed but this must be discussed and agreed in advance with the Field Trials Managers Team.

### **2.6.9 Harvesting of oats**

Premature de-skinning of husked oats can occur if the combine drum-speed is set too high, which can affect yield as well as quality. Visual inspection alone will not reveal the extent of the problem and counts should be undertaken on samples from discard plots specially grown for the purpose. Discard plots should be sown with varieties that tend to be susceptible to skinning. The winter oat variety Mascani is one such example.

The number of de-hulled grains in a sample of 100 grains should be counted. Combine settings should be adjusted if over five de-hulled grains per 100 grains are observed.

## 2.7 Completion of records

The trial workbook should be used to record all data.

Completed data should be returned to [trials@ahdb.org.uk](mailto:trials@ahdb.org.uk) as soon as records are taken and by the deadlines shown in the table below:

Report	Deadline	Sheets to be returned (use return macro to submit the required workbook tabs)
1) Confirmation of sowing and notification of changes to plan	With 5 days of sowing	Confirmation that the trial has been sown and if it has been sown to plan. Trial layout – clearly changes if trial has not been sown to plan
2) Site data	Autumn sown trials: within two months of sowing. Spring sown trials: as soon as possible and within one month of sowing.	Site data Map of area Field layout sketch Trial layout Trial diary
3) Early data	Autumn sown trials: within two months of sowing. Spring sown trials: within one month of sowing. Some measures maybe recorded after this time.	Early data recording tab Trial diary update
4) Disease data	Winter crops - As soon as recorded and by 11 <sup>th</sup> July. Spring crops plus Autumn sown Spring wheat – As soon as recorded and by 22 <sup>nd</sup> August.  Data submitted by these dates will be used in the calculation of disease ratings but if disease develops after this date, records should be taken and submitted as soon as possible and will be used when practicable.	Disease data recording tab Trial diary update
5) Harvest data	Within 5 days of harvest	Harvest data recording tab Agchem details Trial diary update

Early, disease and harvest plot data tabs contain columns for records likely to be undertaken during the recording period and which may or may not be required by the protocol. Any additional recording columns can be added on the relevant data tabs.

### **2.7.1 Confirmation of sown to plan**

Confirmation that the trial has been sown and if it has been sown to plan. If the trial has not been sown to plan confirmation of the changes must be received clearly marked on the trial layout. A new workbook is likely to be issued to you with updated data tabs to reflect these changes and prevent confusion at time of data submission.

### **2.7.2 Site plot data (Site data, location and plan details)**

For autumn-sown trials this information should be returned shortly after full establishment and within two months of sowing. The information for spring-sown trials should be returned as soon as possible and within a month of sowing.

This report should include:

- Confirmation of sowing to plan or full details of any changes to plan.

This should be done by clearly highlighting the changes on the trial layout tab contained in the workbook. On receipt of the returned workbook the RL Data Team will ensure that the plan has been modified correctly within all areas of the workbook and may re-issue an updated workbook to include these changes in all areas of the workbook including the data tab. If a new workbook is issued it is recommended that any older versions of the workbook are deleted.

- Completed site data tab.
- Map of area. Site location details i.e. how to get to the field by road.
- Field layout sketch. Sketch showing the layout of the trial(s) in the field, in relation to other trials and showing access roads, gates etc.
- Trial layout. Trial sketch showing plot numbers and variety IDs.
- A short post-establishment report of the condition of the trial in the diary tab.

### **2.7.3 Early data**

This sheet will contain:

- All agronomic plot data to be recorded up to heading date (GS55).
- For each measure you will need to provide, date of recording, and the growth stage at time of assessment.

Please submit data as it is assessed.

#### 2.7.4 Disease data

This sheet will contain:

- Disease data relevant to your crop and trial purpose.
- For each measure you will need to provide date of recording, and the growth stage at time of assessment.

Please submit data as it is assessed.

For winter crops valid data returned by 11<sup>th</sup> July and for spring crops by 22<sup>nd</sup> August can be used to calculate disease ratings and used for the next AHDB Recommended List.

Data returned after these dates will be stored in the database for future use.

Where disease levels are very low and a disease assessment is not possible please enter this information in the trial diary each time the trial is visited.

#### 2.7.5 Harvest data

This sheet will contain:

- All plot data, including yield, dry matter and all remaining agronomic data (see 2.7.6).
- For each measure you will need to provide, date of recording, and the growth stage at time of assessment.
- Trial treatments and agrochemical inputs.
- Trial diary comments. Note any factors that may affect the validity of the trial.

#### 2.7.6 Agronomic data recording

The list below details the records required and the scales that should be used. Data should be recorded in the Excel recording tabs within the trial workbooks.

“De-rand” is a de-randomising macro that will allow you to conduct an initial validation of the data. This can be found in the Return macro, a copy of which can be found on the RL extranet. Access to the extranet can be requested via the RL data team at [trials@ahdb.org.uk](mailto:trials@ahdb.org.uk). This function should be used just after an assessment has been carried out for checking disease data so the values can be double checked in the field if necessary. Make a note in the trial diary that this has been done.

The growth stage should be recorded for each observation. The correct growth stage key is given in Appendix 1.

Plot numbers and variety codes must correspond to those on the trial plan within the workbook.

In order to make records comparable across sites, it is essential that the names and units used are as indicated below. Records of other characters will be processed and stored but may not be used.

Data should be taken from all plots unless noted to the contrary.

#### ***Characters and Scales***

Characters to be recorded are listed below. They are listed as:

Obligatory: where the trials should be scored routinely even though the character may be scored at zero for the whole trial - particularly useful in characters such as lodging, shedding and ear loss.

Selected sites: where records are required from a sub-set of the UK trials only. The list of trial sites from which data are required are listed below.

If present: e.g. disease.

Optional: at the discretion of the trials operator.

### ***Agronomic characters***

#### Winter hardiness (1–9)

#### **OBLIGATORY**

Obligatory, from all autumn sown plots. After any period of cold weather, varieties should be scored on a 1-9 scale (where 9 = no damage). See Appendix 2.

#### Date of GS55 (heading date/ear emergence)

#### **OBLIGATORY**

Obligatory. Records for this character should be taken from all treated yield plots. Record the date of ear emergence in the format dd/mm/yyyy for each treated yield plot in winter wheat, winter barley and spring barley fungicide treated trials using the following criteria:

In winter wheat, spring wheat and winter barley trials, record for each plot the date on which 50% of ears are 100% emerged. In spring barley record the date on which ears are 50% visible above the flagleaf ligule. The period between sowing and ear emergence will be calculated and stored as 'Days to ear emergence'.

#### Straw length (cm)

#### **OBLIGATORY for controls SELECTED SITES for all varieties**

Record all plots in the selected T, Lodging (L) and U trials listed below. In all remaining T and U yield plots, recording is obligatory for control plots only. Straw length records are not required from DOP plots.

<b>Crop</b>	<b>Record in trial number</b>
<b>Winter wheat</b>	Record all plots in T and L trials: 502, 504, 506, 509, 519, 524, 526 and 531. Control plots only: all remaining yield trials (T & U). No records required from DOPs.
<b>Winter barley</b>	Record all plots in T and L trials: 601, 602, 603, 604, 606, 613, 618 and 622. Control plots only: all remaining yield trials (T & U). No records required from DOPs.
<b>Spring barley</b>	Record all plots in T trials: 652, 654, 662, 666, 667, 669, 671  Control plots only: all other yield trials (T & U) No records required from DOPs.
<b>Other crops</b>	Record all yield plots (T & U) in all trials.

Using a graduated rod, the height of the crop in centimetres should be measured at several points in the plot chosen at random (but avoiding abnormal areas) and expressed as a single mean value. The measurement should be from ground level to the top of the ear, ignoring awns.

### Leaning%

### **OBLIGATORY**

Obligatory, from all plots.

Where areas of the plot are leaning to not more than 45° to the vertical.

An additional record should be made at harvest even if the character has been recorded previously.

### Lodging%

### **OBLIGATORY**

Obligatory, from all plots

Where areas of the plot have gone down, from the base of the plant to an angle greater than 45° to the vertical. Lodging and leaning should be assessed at the same time. Trial operators should routinely check for eyespot during recording to assess if it is a contributory factor (use the trial diary to record these observations).

Record lodging (and leaning) as soon as it occurs, as there may be observable differences at this stage that cannot later be seen.

An assessment at harvest should always be made even where no lodging is present (i.e. all values are 0 even if it has been scored previously).

There are two types of lodging, stem lodging and root lodging. Root lodging is the result of a failure below ground. The whole root structure moves as forces acting on the plant above ground overcome the plant's anchorage, allowing the plant to fall. Where lodging and/or leaning has occurred, examine the plots and assess what proportion of the lodging is above ground (stem) or below ground (root). This record does not replace the standard lodging and leaning scores and the sum total of root and stem lodging should equal the total lodging score.

\*The differentiation between these two types of lodging may not be possible where both types are present within plots. Advise the Field Trials Managers Team if this is the case.

**Lodging%:** obligatory from all plots. The lodging plot value must be equal to the sum of the stem and root lodging scores for the same plot.

**Stem lodging%:** \*obligatory, from all plots.

**Root lodging%:** \*obligatory, from all plots.

The sum of the plot values taken on the same day for stem lodging + root lodging should be equal to the lodging% score.

### Brackling%

### **OBLIGATORY – barley and oats**

Obligatory from all barley and oat plots, and if present in other crops.

This term refers to buckling of the straw at a point well above ground level. It occurs particularly in barley and oats, when the crop has become over-ripe but varietal differences may occur at an earlier stage. A record should be made at harvest even if the character has been recorded previously.

### Ripening date

### **OBLIGATORY**

Obligatory. Records for this character should be taken from all yield plots. Assessed when the grain is first hard, difficult to divide by thumbnail (GS91). The crop may not necessarily be ready to cut at this stage.



For oats it may be necessary to use straw colour as the criterion for ripeness.

Record in the format dd/mm/yyyy.

Ripening date can be assessed as described below.

- The assessment should take place where the earliest variety is at growth stage 91. Use a 1-9 scale to record maturity:

9	8	7	6	5	4	3	2	1
Ripe	2 days later	4 days later	6 days later	8 days later	10 days later	12 days later	14 days later	16 days later

- Record each plot in the trial on the 1 to 9 scale. A second visit to confirm the earlier observation would be advisable.
- Convert the 1 to 9 scale to dates. Please send in the ripening dates not the 1-9 assessments.

Example:

Plot	Score	Estimated ripening date
1	9	02/08/17
2	8	04/08/17
3	5	10/08/17
4	4	12/08/17
5	2	16/08/17
6	7	06/08/17

#### Necking%

#### **OBLIGATORY**

Obligatory from all barley plots, and if present in other crops.

Creasing of the straw just below the ear in the mature plant. A record should be made at harvest even if the character has been recorded previously.

#### Ear loss (1–9)

#### **OBLIGATORY**

Obligatory from all barley plots, and if present in other crops.

Where 9 = no ear loss. Usually occurs in barley as a result of necking. This is an important field character and should be assessed at the time of harvest even if all values are 9 (no ear loss). Estimate the number of ears lost per m<sup>2</sup> for the plot(s) with the most losses so that the approximate yield loss can be estimated. A record should be made at harvest even if the character has been recorded previously. Trial operator to provide an assessment key.

#### Bird damage (1–9)

#### **OBLIGATORY**

If present mid-season and obligatory at harvest from all plots. Where 9 = no bird damage. Assessments should be made wherever it occurs in a trial since decisions have to be made on the validity of each plot affected. A record should be made at harvest even if the character has been recorded previously and even if all scores are 9 (no damage).

Whiteheads whole plots%

**IF PRESENT**

Obligatory from all wheat plots if present; if present in other crops.

Record the occurrence of whiteheads within the trial. Note the likely cause(s) of the whiteheads (especially if the cause appears to be eyespot).

Shedding (1–9)

**OBLIGATORY**

Obligatory just prior to harvest by assessing the number of grains on the ground.

Where 9 = no shedding. Occurs mainly in wheat and oats in the mature plant. If losses are seen, estimate the number of grains lost per m<sup>2</sup> for the lowest and highest scores recorded so that the severity of yield loss can be estimated. A record should be made at harvest even if the character has been recorded previously and even if all scores are 9 (no shedding). Trial operator to provide an assessment key.

Sprouting%

**OBLIGATORY**

Obligatory if present in the ear at harvest even if all scores are zero. Record if present at any other time. If sprouting is seen, either in plots or harvested samples, the Field Trials Managers Team should be informed.

Combine losses (1–9)

**OBLIGATORY**

Obligatory from all plots.

Where 9 = no loss. Combine losses should be assessed straight after the trial has been harvested and a record submitted even if all scores are 9 (no losses). If losses are seen, estimate the number of grains lost per m<sup>2</sup> so that the severity of yield loss can be estimated. Trial operator to provide an assessment key.

Harvest date

**OBLIGATORY**

Obligatory. Record in the format dd/mm/yyyy.

Obligatory from yield plots. Notify the Field Trials Managers Team that harvest has taken place on the day of harvest, or first thing the following day. Yield with dry matter should be returned in report 4 within 5 days of the harvest of the trial, together with any outstanding other data.

***Plot dimensions***

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. If the inter-plot gap varies it should be measured for each plot.

***Growth stage***

Usually 92 at harvest.

Record all plots. The fresh yield should be recorded in kg. Any tare weight should be subtracted before submitting the data. Return with the yield the completed Agchem sheet and note in the diary any factors which may have affected the yield of the trial or individual plots. If, within the harvested plot area, any drill rows, or part of rows are missing, the following information should be supplied:

- i.) The plot number containing the missing row(s).
- ii.) The length of row(s) missing.
- iii.) Whether the missing row is internal or one of the two outer ones.
- iv.) The number of rows normally drilled.
- v.) The dimension between drilled rows (in metres)

The dry matter % of each plot must be determined. This can be assessed by the oven method, by electronic moisture analyser (within a specified moisture range), NIR or NMR (see Appendix 7).

## 2.7.7 Disease assessment, recording and sampling for UKCPVS

### ***Diseases to be assessed***

The trial operator has a duty of care to ensure that the disease present is the one recorded. If in any doubt, expert diagnosis should be obtained. You may send a photo of the disease to the trials inbox for diagnosis if in doubt.

Disease	Winter wheat	Spring wheat	Winter barley	Winter triticale	Winter rye	Spring barley	Winter oats	Spring oats
Mildew	+	+	+	+	+	+	+	+
Yellow rust	+	+	+	+	+	+		
Brown rust	+	+	+	+	+	+		
Crown rust							+	+
Septoria tritici blotch	+	+(AW)		+	+			
Tan spot	+	+						
Ramularia			+			+		
Rhynchosporium			+			+		
*Net blotch			+			+		
Fusarium ear blight	+	+						
Green leaf area	+	+	+	+	+	+	+	+
Eyespot	+	+(AW)						
Whiteheads %	+	+						

AW: spring wheat sown in the late autumn.

\*Where different forms of net blotch are present in the same trial (spot/stripe/net form), please record each of these under a different measure. If simply 'NET BLOTCH %' is recorded, this will assumed to be net blotch net.

Other diseases (e.g. septoria nodorum, cephalosporium leaf stripe, sharp eyespot, leaf blotch of oats (*Pyrenophora avenae*) septoria blotch of oats (*Parastagonospora avenae*)) must be assessed if there are clear varietal differences.

Please take photos of any natural fusarium infection at assessable levels and send them to [trials@ahdb.org.uk](mailto:trials@ahdb.org.uk). This will help determine whether we can use the assessment in the ratings.

### ***Timing of assessments***

At or slightly before GS31      Record foliar disease if moderate infections (around 5%) occur in any plot.

GS30–45      Winter barley only. Check carefully for rhynchosporium infection and record all plots if any infection is seen within a treatment (i.e. there is no need to record treated plots if disease has been controlled by an earlier fungicide application).

GS31–55      An assessment of foliar disease is required if moderate infections (around 5% in untreated plots or 2% in treated plots) develop in any plot. Once infection reaches 5% assessments should be done at least every two weeks, depending on crop and disease progression.

GS55–80      Assess all foliar diseases that reach 5% infection in any one plot during this period. Once 5% is reached, aim to assess the trial every two weeks, or frequently enough so that meaningful disease scores can be obtained i.e. the progression of the disease from one assessment to another can be tracked. This may mean visiting the trial more than every 2 weeks, or less than every 2 weeks. It may be appropriate to assess different diseases at different stages within this period (e.g. mildew might be better assessed relatively early and brown rust later).

When assessing diseases also record the percentage green leaf area (Green Leaf Area%) remaining on the leaves being assessed. If disease levels are too low for an assessment, please record this in the trial diary.

Please record on the disease assessment tab if a plot is significantly more gappy than others in the trial, or if it is waterlogged. This may mean some data for certain diseases cannot be used.

## Assessment keys

The following keys should be used:

Foliar diseases	<b>NIAB-TAG Key No 11.</b>	(Appendix 3)
Fusarium ear blight	<b>NIAB-TAG Key No 13.</b>	(Appendix 4)
Ear infection by <i>Septoria nodorum</i>	<b>ADAS Key No 1.6.3.</b>	(Appendix 5)
Eyespot	<b>NIAB-TAG Key No 12</b>	(Appendix 6)

Disease to be recorded as a percentage. Data must be submitted as a percentage score. For diseases or disorders for which no standard key exists, a scale which increases with severity should be used. Values may not exceed 100. The character and units used in assessment must be clearly recorded (e.g. Black speckling % leaf area).

## General Assessment Procedures

i)	Only assess diseases which reach a minimum of 5% infection in any one untreated plot. Where disease is present in fungicide treated trials, please see (vii)
ii)	Each time a trial is assessed for disease, please enter a comment on the status of diseases which have not been assessed e.g. that they are absent or less than 5%.
iii)	Assess disease in the plots in all replicates of the trial (even if all values are 0, e.g. in treated plots).
iv)	Assess foliar diseases on a 'whole-plot' basis, i.e. make an overall assessment of the average percentage infection on all tillers in a small area of the plot and repeat at a minimum of four points in each plot. Do not restrict examination to individual tillers or individual leaves.
v)	Where primary foci of high infection occur, these should be averaged over the plot as a whole; (% infection in focus x % plot area of focus) e.g. a primary focus of 50% leaf area infection occupying 5% of the plot area should be recorded as 2.5% ( $50\% \times 5\% = 2.5\%$ ). When foci exist for rusts and rhynchosporium also record the maximum percentage infection seen on each plot.
vi)	For foliar diseases, examine the top four leaves. As the lower leaves senesce naturally at later growth stages it will become necessary to examine only the top three or two leaves or, in the case of very late assessments, the flag leaves alone. Also record the percentage green leaf area ( <u>Green Leaf Area%</u> ) remaining on the leaves being assessed at each assessment timing.
vii)	Fungicide treated trials must be inspected for failure to control disease. A full record must be taken if the infection level for any disease reaches 5% or greater. A comment on the disease levels in treated trials should accompany all disease records from the corresponding untreated trials.

## ***Disease names***

Only the accepted disease names and units may be used, exactly as specified below:

MILDEW%	SEPTORIA NODORUM%	CROWN RUST%
SEPTORIA NODORUM EAR%	SEPTORIA TRITICI%	CROWN RUST MAX%
YELLOW RUST%	SEPTORIA SPP%	FUSARIUM EAR%
YELLOW RUST MAX%	RHYNCHOSPORIUM%	EYESPOT DI
BROWN RUST%	RHYNCHOSPORIUM MAX%	SHARP EYESPOT DI
BROWN RUST MAX%	NET BLOTCH%	BYMV (0-5)
NET BLOTCH SPOT %	NET BLOTCH STRIPE %	BYDV%
TAN SPOT%	RAMULARIA%	
LEAF SPOT OF OATS %	SEPTORIA BLOTCH OF OATS %	

If no disease assessments have been made on untreated trials during the period GS55 (ear half emerged) and GS80 (late milk/early dough), the fact should be recorded and an e-mail message sent to [trials@ahdb.org.uk](mailto:trials@ahdb.org.uk) by the deadline.

## ***Yellow rust assessments***

Due to the diversity in the yellow rust pathogen population, it is essential that RL data are able to reflect changes in virulence on varieties. It is also essential that any assessments showing higher levels of yellow rust than would normally be expected on a variety are correct. Therefore, all yellow rust assessments must be submitted to the trials inbox within three days of carrying out the assessment. AHDB will look at the data and may request a sample of certain varieties be sent to the UKCPVS (see below). This may require a return trip to the site.

## ***Sampling for UKCPVS***

The United Kingdom Cereal Pathogen Virulence Survey (UKCPVS) is an AHDB/APHA funded project, which seeks to monitor changes in pathogen populations.

The survey is dependent on the return of diseased leaf samples from crops and trials around the country and variety trial plots that are untreated with fungicide are an ideal source of such samples. It is a contract requirement that all trial operators must provide samples.

Yellow and brown rust samples from each winter wheat trial should be sent to the UKCPVS using freepost. Sampling instructions are available at <https://www.niab.com/research/agricultural-crop-research/research-projects/uk-cereal-pathogen-virulence-survey>.

The UKCPVS would like to receive a sample from one variety for each disease per trial, the variety is not important unless there is an obviously unusual outbreak, the main criteria is that the disease should look fresh and active to ensure the best survival in the post.

If disease is found on a variety with a high RL resistance rating for that disease, contact the trials inbox [trials@ahdb.org.uk](mailto:trials@ahdb.org.uk) and Amelia Hubbard from the UKCPVS (01223 342351, [amelia.hubbard@niab.com](mailto:amelia.hubbard@niab.com)) who may ask for the sample to be sent using recorded delivery (cost will be reimbursed).

## ***Disease assessment training***

All new trial operators (including new employees of existing trial operators) who are/will be disease assessing RL trials will be required to attend disease assessment training organised and paid for by AHDB. These usually occur in the spring/early summer. All operators who are/will be disease assessing RL trials will be required to attend this disease assessment training once every three years.

## **2.8 Trial samples and quality testing**

### **2.8.1 Introduction**

Samples for the assessment of quality and moisture content will be required from all yield trials. Full instructions with the appropriate labels and bags will be sent by the Field Trials Manager prior to harvest.

All samples should be despatched by the deadlines specified in Appendix 8.

### **2.8.2 Quality assurance**

The quality work undertaken contributes important data to the process of variety evaluation. Small differences between the quality characteristics of varieties may have serious implications for their commercial prospects. The integrity of the quality tests and of the samples provided by trial managers to collaborating laboratories is under continuing scrutiny.

Quality assurance checks will be carried out on parameters such as:

- The time taken to deliver samples to their destination following harvest (making allowances for drying times etc.)
- Varietal identity and purity
- Moisture content
- Damage caused during the harvest or by overheating during drying
- Infestation of grain by volunteers, weed seeds and pests
- Disease infection (the amount of damage caused by blossom midge must be recorded if present).

Please take every care in the harvest of your samples and give them the highest possible priority.

It is essential that all samples are truly representative of the variety from which they are taken.



### **2.8.3 Sampling protocol**

#### ***Labels and bags***

Labels and bags will be supplied by the Field Trials Manager prior to harvest. Please check that you have been sent all the labels you require before harvest begins, checking against the sampling protocol.

The labels supplied are pre-printed with details of the trial from which the samples are being taken together with the plot number and/or variety identity.

### **2.8.4 Sample types**

#### ***Dry matter samples***

Moisture content should be determined from every harvested plot in a trial. The following methods are acceptable:

- 1) Oven drying
- 2) Moisture meters. These can only be used for trials where all samples are in the range of 12% to 18% moisture content. Trials with moisture contents outside of this range must be assessed by the oven method.

NIR and NMR methods may be acceptable, but prior permission must be sought via the Trials Coordinator at least two months before harvest and accompanied by disclosure of the protocol that the operator intends to follow and the calibration log.

For details of these techniques see Appendix 7.

#### ***Quality samples***

Use the cloth bags supplied by the Field Trials Manager. The size of these bags varies and sufficient numbers of the appropriate size should be sent prior to harvest. Please advise the Field Trials Manager if this is not the case.

Each sample must have a label both inside and outside the bag.

Each sample bag should be secured tightly using good quality string. Do not use baler string, elastic bands, wire or plastic ties. As much space as possible should be left within the bag to allow for air movement when drying/conditioning.

### 2.8.5 Taking samples

It is essential that all samples:

- except for dry matter, are taken from non-lodged plots.
- 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 by grain of the previous plot. Samples should not be taken until several seconds after grain has started flowing fully from the combine elevator.
- are taken from the same source. If many samples are required from a trial you should mix the produce from all replicates and sub sample the bulk. However any replicate with lodging in any variety should not be included in the bulk without first consulting the Trials Coordinator.
- contain the weight of grain requested.

Moisture samples must always be taken at the time of plot weighing. Where a variety is in both fungicide treated and untreated trials, all samples except those for dry matter should be taken from the treated plots only unless specified. Quality samples may not be required from every variety - refer to the sample requirement spreadsheet sent before harvest for details.

### 2.8.6 Storage and drying

#### *Storage and drying*

Grain deteriorates extremely quickly if it is stored when damp and, under certain conditions, can be rendered useless within hours. Malting barley samples should be dried to 12% moisture content and other samples to 15% before they are stored or transported.

Malting samples (e.g. MMG) are especially prone to damage because the grain has to germinate to be of any use so they should be dried to 12% moisture content or below. A proportion of payment may be withheld if laboratory tests show that the mean moisture content of the malting samples as received by them are above 12% and further drying is required: see Appendix 10.

Drying should be done on site using a cold/warm air dryer. The drying temperature should not exceed 45°C for barley and 60°C for any other cereals.

Where it is necessary to store samples, it is very important that they are stored in good conditions, dry and vermin free. Discuss any drying or storage problems with the Field Trials Manager.

There are three levels of priority:

1. Samples to be sent immediately after harvest (e.g. 50 g Wheat Physical Quality).
2. Those to be sent as soon as possible after harvest, once the moisture content of the samples has been dried down to 12% (barley) or 15% (other crops). Samples should be in transit within 48 hours of harvest - if drying takes longer than this, please contact the Field Trials Managers Team.
3. Those to be held on site at 12% or 15% moisture content awaiting further instructions (e.g. MMG samples). Once notification is received that samples are required, it is very important that they are dispatched quickly (within 48 hours of notification).

### **2.8.7 Packaging and transporting samples:**

All samples of a similar type should be packaged together and separate from other samples. Strong sacks should be used to hold the samples, which should be clearly labelled with the contents (i.e. the sample type). 25 kg per item is normally the carriers' weight limit.

### **2.8.8 Instruction relating to specific sample types**

Full details will be sent prior to harvest.

### **2.8.9 Dispatch notification:**

At the time of despatch of samples please notify the following people that they are in transit by e-mail:

- The addressee
- The Field Trials Manager

The Field Trials Manager must be consulted before discarding any samples.

## **2.9 Trial inspection**

All trials will be inspected by the Field Trials Team and, in some cases, it may be necessary to visit on more than one occasion.

The requirements for Trials Operators in respect of inspections are as follows:

1. To give reasonable access to trials to inspectors and provide full location and site details.
2. To supply the inspector with information (for example sprays applied etc.) within seven days of a request.
3. To co-operate with the inspector in making any non-routine assessments required to establish the validity of the trial (for example population counts).
4. To carry out any action agreed in consultation with the inspector. In particular it is important that any requirement to shorten plots is undertaken and that missing values are returned on any plots which have been dropped from the trial.

The trials inspection also provides an opportunity for feedback to RL Project Consortium about any problems with the trials protocol and so Trial Operators are encouraged to make any points to the inspector so that these can be considered for future revisions to the protocol.

## Appendix 1 - Growth stage key

Seedling growth		Tillering	
10	first leaf through coleoptile	20	main shoot only
11	first leaf unfolded	21	main shoot and 1 tiller
12	2 leaves unfolded	22	main shoot and 2 tillers
13	3 leaves unfolded	23	main shoot and 3 tillers
14	4 leaves unfolded	24	main shoot and 4 tillers
15	5 leaves unfolded	25	main shoot and 5 tillers
16	6 leaves unfolded	26	main shoot and 6 tillers
17	6 leaves unfolded	27	main shoot and 7 tillers
18	8 leaves unfolded	28	main shoot and 8 tillers
19	9 or more leaves unfolded	29	main shoot and 9 or more tillers
Stem elongation		Booting	
30	Ear at 1 cm	41	flag leaf sheath extending
31	1st node detectable	43	boots just visibly swollen
32	2nd node detectable	45	boots swollen
33	3rd node detectable	47	flag leaf sheath opening
34	4th node detectable	49	first awns visible
35	5th node detectable		
36	6th node detectable		
37	flag leaf just visible		
39	flag leaf ligule/collar just visible		
Inflorescence (ear emergence)		Anthesis	
51	First spikelet of inflorescence just visible	60	beginning of anthesis
52	¼ of inflorescence emerged	61	
55	½ of inflorescence emerged	64	anthesis half-way
57	¾ of inflorescence emerged	65	
59	inflorescence completed	68	anthesis completed
		69	
Milk development		Dough development	
71	caryopsis watery ripe	83	early dough
73	early milk	85	soft dough
75	medium milk	87	hard dough
77	late milk		
Ripening			
91	caryopsis hard (difficult to divide by thumb-nail)		
92	caryopsis hard (can no longer be dented by thumb-nail)		
93	caryopsis loosening in daytime		

Reference: Tottman D R, Broad H (1987), Decimal Code for the Growth stages of Cereals Annals of Applied Biology 100, 683-687

## Appendix 2 - Winter hardiness assessment key

1–9 scale. A high figure shows good resistance to winter hardiness.

1	76% to 100% of plants dead.
2	Very severe leaf damage, 51% to 75% of plants dead.
3	Very severe leaf damage, 26% to 50% of plants dead.
4	Severe leaf damage, up to 25% of plants dead.
5	Severe leaf damage and a few dead plants.
6	Severe leaf tipping
7	Moderate leaf tipping
8	Slight to very slight leaf tipping
9	No damage

**Note:** Damage is frequently not apparent until several days after the end of a cold period.

### Appendix 3 - Foliar disease assessment key

- 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. Data must be submitted as a percentage score.
- 5) If foci present, record average over the plot as a whole.

1-9 scale	% Infection	Mildew	Yellow rust	Brown rust
1	0	No infection observed		
2	0.1	3 pustules per tiller	1 stripe per tiller	25 pustules per tiller
3	1	5 pustules per leaf	2 stripes per leaf	100 pustules per leaf
4	5	2 lower leaves appear ¼ infected	Most tillers infected but some top leaves uninfected	Top leaf - numerous pustules but leaves appear green overall
5	10	2 lower leaves appear ½ infected	All leaves infected but leaves appear green overall	Top leaf - pustules sufficiently dense to give brown appearance in patches
6	25	Leaves appear ½ infected ½ green		
7	50	Leaves appear more infected than green		
8	75	Very little green leaf tissue left		
9	100	Leaves dead - no green tissue left		

1-9 scale	% Infection	Septoria	Rhynchosporium	Net blotch
1	0	No infection observed		
2	0.1	1 lesion per 10 tillers	1 lesion per 10 tillers	1 small lesion per 10 tillers
3	1	2 small lesions per tiller	1 lesion per tiller	1 small lesion per tiller
4	5	Small lesions beginning to form areas of dead tissue across width of leaf	Discrete lesions on most tillers, about 2 per leaf	2 lower leaves appear ¼ infected. Other leaves - few lesions
5	10	2 lower leaves - large areas of diseased tissue some covering 1/3 of leaf	Lesions coalescing but leaves appear green overall	2 lower leaves appear ½ infected. Other leaves - numerous lesions
6	25	Leaves appear ½ infected ½ green		
7	50	Leaves appear more infected than green		
8	75	Very little green leaf tissue left		
9	100	Leaves dead - no green tissue left		

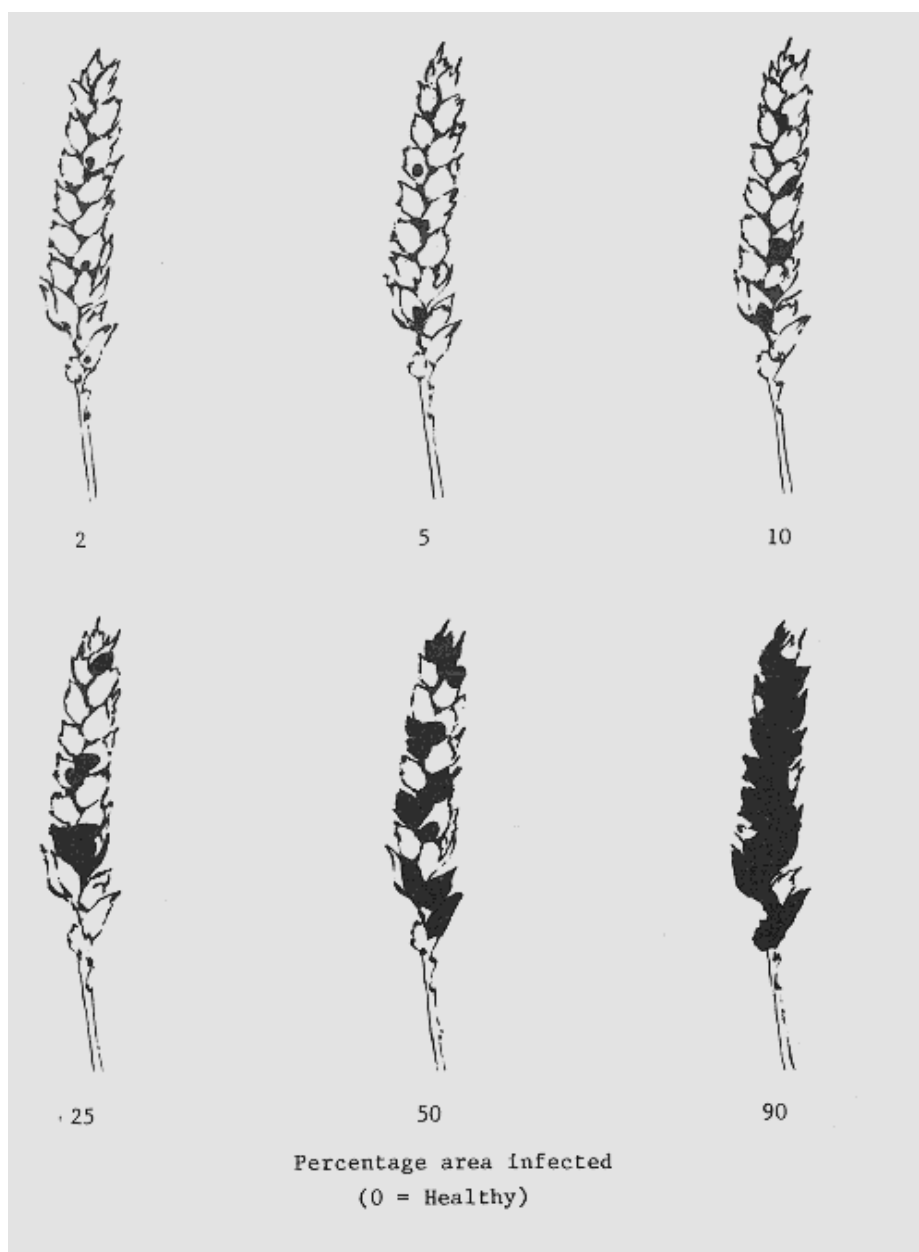
NIAB-TAG, Cambridge CB3 OLE

1–9 scale	% Infection	Ramularia*
1	0	No infection
2	1–5	Sparse lesions on upper leaves
3	6–10	More lesions on upper leaves
4	11–20	Numerous lesions on middle and upper leaves with some necrosis
5	21–30	Many lesions and severe necrosis on upper leaves and lesions on middle leaves
6	31–40	Extensive lesions on upper leaves many lesions on middle leaves and necrosis
7	40–50	Severe damage to upper leaves more lesions and necrosis on middle and lower leaves
8	51–75	100% lesions on upper leaves severe necrosis on middle leaves
9	75–100	Almost all leaves necrotic with lesions on all leaves

\*Scores should be taken from the middle of plots, never the edge. There are only about 5-7 days when you can get an accurate ramularia assessment, so trials should be visited regularly from flowering onwards to monitor the progression of the disease. Please also record GLA.

Please refer to this page for more information on the identification and scoring of ramularia  
<https://ahdb.org.uk/ramularia>

## Appendix 4 - Ear blight of wheat key



### Notes of assessment

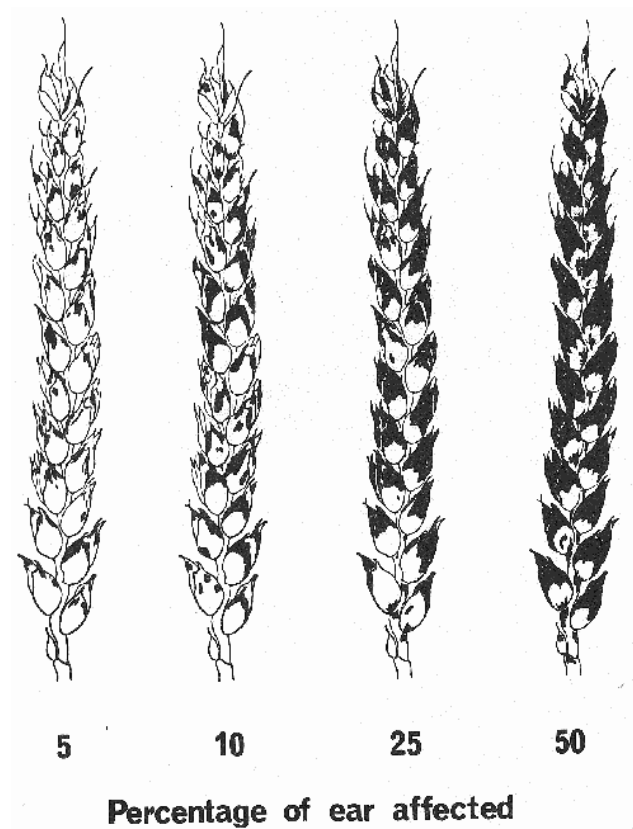
- 1) Carry out the assessment between GS80–90.
- 2) Select 20 ears at random from each plot.
- 3) Estimate the percentage area infected on individual ears using the illustrations above as a guide.
- 4) Record the mean value from the 20 assessments.

For further details see Parry D W, Bayles R A & Priestley R H (1984).  
Resistance of winter wheat varieties to Ear Blight (*Fusarium culmorum*).  
Journal the National Institute of Agricultural Botany 16, 465-468.

NIAB-TAG, Cambridge CB3 0LE



## Appendix 5 - Wheat glume blotch key



### Notes:

1. Crops may be examined at any growth stage after GS 60 if glume blotch has appeared.
2. Assess 30 ears selected at random from each plot.
3. Assess the % ear affected on both sides of the ear and record a mean figure for that ear. Interpolate if necessary, e.g., if an ear falls between 10 and 25% give it a score in between, say, 15-20%.

Ministry of Agriculture, Fisheries and Food (Publications), Tolcarne Drive, Pinner, Middlesex HA5 2DT.

## Appendix 6 - Eyespot of wheat key

Eyespot of Wheat (*Oculimacula yallundae* and *O. acuformis*)

Infection category	Disease severity description
0	Uninfected.
1	Slight eyespot (one or more small lesions occupying less than half the circumference of the stem).
2	Moderate eyespot (one or more lesions occupying at least half the circumference of the stem).
3	Severe eyespot (stem completely girdled with lesions; tissue softened so that lodging would readily occur).

### Notes of assessment

- 1) Examine 20 tillers per plot.
- 2) Assign each tiller to one of the infection categories above.
- 3) Write the number of tillers in each category on the record sheet.
- 4) An index will be calculated from the data as follows:

$$\text{Disease index} = \frac{(0 \times a) + (1 \times b) + (2 \times c) + (3 \times d)}{(a + b + c + d)} \times \frac{100}{3}$$

Where a, b, c and d are the number of tillers examined which fall into the categories 0, 1, 2, and 3 respectively.

For further details, see Scott, P R and Hollins, T W (1975). Effects of eyespot on the yield of winter wheat. Annals of Applied Biology 78, 269-279.

NIAB-TAG, Cambridge CB3 OLE 1985

## Appendix 7 - Determination of Dry Matter on Cereals

### Oven Method

#### *Principle*

Samples are dried until constant mass is achieved. For expediency it is permissible to dry samples for a fixed time provided it can be demonstrated that this is sufficient to reliably achieve constant mass for samples even when the chosen apparatus is fully loaded with samples.

#### *Apparatus and Equipment*

##### Oven

Electrically heated and controlled in such a way that, during normal working, the mean temperature of the air and of the shelves carrying the test samples is 100°C and operates within the range 96–104°C.

The oven should be regularly maintained and regularly checked for correct operation.

##### Sample drying trays

Durable under test conditions and being of a size which enables the test sample to be distributed evenly within the tray and at depth which does not protract the drying time.

##### Balance

Accuracy 0.1g ± 0.05g. The balance should be regularly serviced and calibrated. Frequent checks on its correct operation should be made during the period when the balance is in use.

#### *Method*

The test samples are received direct from the combine in hermetically sealed bags or containers. Weigh a fully representative 100g sub-sample or an accurately recorded catch-weight between 100–110 g and place into the drying tray with an identifying label. Place the drying trays containing the test samples into the pre-heated oven. Dry the test samples for the pre-determined period or until constant mass is achieved (see below).

Remove the test samples from the oven and record the dry weight of the test sample to 0.1 g.

If achievement of constant mass is to be directly measured, five check samples should be removed from a range of positions within the oven after a period of about 16 hours. The dry weight of these samples should be recorded as above. The check samples should be returned to the oven and dried for a further 2 hours and the dry weight again recorded. A dry matter content of less than 0.3% between the two determinations will be accepted as representing constant mass. If constant mass has not been achieved, the check samples should be returned to the oven for further periods of two hours until constant mass is observed.

#### *Results*

The dry matter content of the test sample is calculated as follows;

$$\text{Dry Matter (\%)} = \frac{\text{Dry test sample weight}}{\text{Original test sample weight}} \times 100$$

## **Near Infrared Reflectance (NIR) & Nuclear Magnetic Resonance (NMR)**

Contact Field Trials Managers Team.

### **Electronic moisture analyser (moisture meter)**

#### ***Principles***

Moisture analysers, either separate instruments or probes on combines, may be used for determining the dry matter of harvested grain. There are no restrictions on the make or model of moisture analyser that may be used, provided the conditions described below are met.

The manufacturer's recommendations for use must be followed. On-combine analysis must only be carried out on equipment specifically manufactured for this purpose. 'Desk-top' analysers should not be used on the combine because it has been shown that heat and vibration can cause inaccuracy.

#### ***Equipment***

The analysing equipment must:

- be regularly calibrated according to the manufacturer's instructions using check samples (see reference below) and have a moisture content accuracy of plus/minus 0.5%. The calibration data should be retained for a minimum of one year.
- be serviced regularly, especially just prior to harvest, according to manufacturer recommendations. The action taken should be documented and the information held for a minimum of one year.
- be fit for use in accordance with manufacturer instructions. It should have an adequate power supply throughout operation. Instructions should be held with the machine and all operators adequately trained in its operation.

#### ***In the field***

- The determination of dry matter should be the same for all plots in a trial replicate. For this reason, there should be minimal risk of rainfall during the harvest of a replicate. If there is a significant risk then backup samples should be taken from all plots to allow comparison through the oven method or NMR.
- The grain samples to be analysed must be between 83 and 88% dry matter (12 to 17% moisture content). If it is possible that samples in a replicate may fall outside this range, samples must be taken from all plots so that the oven method or NMR may be used should it be necessary. Suitable polythene bags or plastic pots and labels should be obtained locally and made available at all times during the harvest to allow this to be carried out.
- The grain to be analysed must be fully ripe with no green ears/grains in any sample. In these cases the samples for the oven method or NMR should be used.
- The data sent to NIAB-TAG must be in the form DRY MATTER%.

References: BS 4317-24:1990, ISO 7700/1-1984 Method of checking the calibration of moisture meters for cereals.

## Appendix 8 - Deadlines and milestones

It is required that RL Project Consortium trials will be grown to the highest standards and that contractors will give them priority. Failure to meet the trial specification without good reason will be a breach of the contract and could result in reduced or no payment of the agreed fee for that trial.

If any operation, for example drilling, disease recording or harvesting, are delayed or carried out in poor conditions, it is the responsibility of the contractor to inform the Field Trials Managers Team and to explain the reasons for the delay/ problem. **Failure to inform the Field Trials Managers Team will constitute a breach of the contract.**

**Failure to return data and / or samples by these deadlines without good reason will constitute a breach of contract.**

Report	Deadline	
Confirmation of sowing and notification of changes to plan	Within 5 days of sowing.	Confirmation that the trial has been sown and if it has been sown to plan. Trial layout sheet, clearly showing changes if trial has not been sown to plan
Site data Early plot data	<u>Autumn sown trials</u> : within two months of sowing. <u>Spring sown trials</u> : as soon as possible and within one month of sowing.	Site data Map of area Field layout sketch Trial layout Trial diary
Early data	<u>Autumn sown trials</u> : within two months of sowing. <u>Spring sown trials</u> : within one month of sowing. Some measures maybe recorded after this time.	Early data recording tab Trial diary update
Disease data	<u>Winter crops</u> - As soon as recorded and by 11 <sup>th</sup> July. <u>Spring crops plus Autumn sown Spring wheat</u> – As soon as recorded and by 22 <sup>nd</sup> August.  <u>Yellow rust in winter wheat</u> – within 3 days of assessment  Data submitted by these dates will be used in the calculation of disease ratings but if disease develops after this date, records should be taken and submitted as soon as possible and will be used when practicable.	Disease data recording tab Trial diary update
Harvest data	Within 5 days of harvest	Harvest data recording tab Agchem details Trial diary update

<b>Responses to trial queries</b>	
Response to email or telephone queries from the Trials Coordinator during the season	Seven days after the request or by harvest if this is sooner
Response to email or telephone queries from the Trials Coordinator after the trial has been harvested	One working day

<b>Quality samples</b>	
Grain quality samples	To be received by laboratory (as designated by the Field Trials Manager) within three days of harvest unless drying is required when they should be sent within five days.
Physical quality (wheat)	To be received by laboratory (Campden BRI) within three days of harvest
All other samples	To be received by laboratory designated by the Field Trials Manager within three days of notification that they are required.

## Appendix 9 – List of cereal trials 2022-26 with sowing specifications and summary of treatments

This is the list of trials with 5-year contracts forming part of this tender. The full list of trials with specifications are in the spreadsheet: RL trial specifications H2022-H2026

Crop	Trial ID	Component trials	Location	Time of sowing	Rotation	Soil type	Management
RY	425	Yld T & DOP	Southern or Eastern England	As host farm crop	As host farm crop	As host farm crop	As host farm crop
SB	651	Yld T & DOP	North Aberdeenshire coastal, Moray	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	653	Yld T & DOP	Fife	As host farm crop	As host farm crop	Suited to malt production	Malt for distilling
SB	654	Yld T & Yld U	Devon-Cornwall	As host farm crop	As host farm crop	Not specified	Feed
SB	656	Yld T & Yld U	Scottish Borders	As host farm crop	As host farm crop	Suited to malt production	Malt for distilling
SB	657	Yld T & DOP	East Yorkshire Wolds	As host farm crop	As host farm crop	Suited to malt production	Malt production, brewing or distilling
SB	659	Yld T & DOP	South west Scotland	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	660	Yld T & DOP	East Norfolk-East Suffolk	As host farm crop	As host farm crop	Suited to malt production	Malt for brewing
SB	661	Yld T & Yld U	West or Mid-Norfolk (malting barley area)	As host farm crop	1st cereal	Suited to malt production	Malt for brewing
SB	662	Yld T & DOP	Wales	As host farm crop	As host farm crop	Not specified	Feed
SB	663	Yld T & DOP	Kent	As host farm crop	As host farm crop	Suited to malt production	Malt for brewing
SB	664	Yld T & DOP	Perth Dundee area	As host farm crop	As host farm crop	Suited to malt production	Malt for distilling
SB	665	Yld T & Yld U	Hampshire	As host farm crop	As host farm crop	Suited to malt production	Malt for brewing
SB	666	Yld T & DOP	Cheshire	As host farm crop	As host farm crop	Not specified	Feed
SB	667	Yld T & DOP	Shropshire, Staffordshire	As host farm crop	As host farm crop	Not specified	Feed
SB	668	Yld T & DOP	Angus	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	669	Yld T & DOP	Northern Ireland	As host farm crop	As host farm crop	Not specified	Feed
SB	670	Yld T & DOP	Ross-shire	As host farm crop	As host farm crop	Suited to malt production	Malt for distilling
SB	671	Yld T & Yld U	East Lothians	As host farm crop	As host farm crop	Suited to malt production	Malt for distilling
SB	672	Yld T & Yld U	Cambridgeshire-West Suffolk	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	673	Yld T & DOP	East Midlands (not Wolds land)	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	674	Yld T & Yld U	West/North Yorkshire or Humber	As host farm crop	As host farm crop	Not specified	As host farm crop
SB	675	Yld T & DOP	Dorset-Wiltshire	As host farm crop	As host farm crop	Suited to malt production	Malt for brewing
SO	721	Yld T & Yld U	Scottish Borders	As host farm crop	As host farm crop	As host farm crop	As host farm crop
SO	722	Yld T & Yld U	Central or southern Scotland (Fife)	As host farm crop	2nd cereal	As host farm crop	As host farm crop

SO	726	Yld T & Yld U	Cambs, Suffolk, Norfolk, Essex	As host farm crop	As host farm crop	As host farm crop	As host farm crop
SO	727	Yld T & Yld U	East Midlands	As host farm crop	As host farm crop	As host farm crop	As host farm crop
SW	551	Yld T & DOP	Suffolk	Feb-March	1st cereal	Medium	As host farm crop
SW	552	Yld T & DOP	Cambs/Herts	Feb-March	1st cereal	Medium-Heavy	As host farm crop
SW	553	Yld T & DOP	Lincolnshire	Feb-March	1st cereal	Light	As host farm crop
SW	554	Yld T & DOP	Lincolnshire	Feb-March	1st cereal	Medium-Heavy	As host farm crop
SW	555	Yld T & DOP	North Yorkshire	Feb-March	1st cereal	Not specified	As host farm crop
SW	556	Yld T & DOP	Hants	Feb-March	1st cereal	Not specified	As host farm crop
WB	601	Yld T & DOP & Lodging	Aberdeenshire	As host farm crop	1st cereal	As host farm crop	Feed
WB	602	Yld T & Yld U & Lodging	Northumberland	As host farm crop		As host farm crop	Feed
WB	603	Yld T & DOP & Lodging	East Yorkshire Wolds	As host farm crop	As host farm crop	Wolds land	Malt production
WB	604	Yld T & DOP & Lodging	Scottish Borders	As host farm crop	As host farm crop	As host farm crop	Feed
WB	606	Yld T & Yld U & Lodging	Teesside	As host farm crop	As host farm crop	As host farm crop	Feed
WB	607	Yld T & Yld U	West/North Yorkshire or Humber	As host farm crop	As host farm crop	(not Wolds)	Feed
WB	608	Yld T & DOP	East Midlands	As host farm crop	As host farm crop	Light soil	Malt production
WB	610	Yld T & DOP	Norfolk (malting barley area)	As host farm crop	As host farm crop	Suited to malt production	Malt production
WB	611	Yld T & Yld U	Essex	As host farm crop	As host farm crop	Medium or heavy soil	Feed
WB	614	Yld T & DOP	Dorset-Wiltshire	As host farm crop	As host farm crop	As host farm crop	Feed
WB	615	Yld T & Yld U	Cambs-Herts	As host farm crop	As host farm crop	As host farm crop	Feed
WB	616	Yld T & Yld U	Warwickshire	As host farm crop	As host farm crop	As host farm crop	Feed
WB	617	Yld T & DOP	Cheshire	As host farm crop	As host farm crop	As host farm crop	Feed
WB	618	Yld T & DOP & Lodging	Northern Ireland	As host farm crop	As host farm crop	As host farm crop	Feed
WB	622	Yld T & Yld U & Lodging	Devon-Cornwall	As host farm crop	As host farm crop	As host farm crop	Feed
WB	624	Yld T & Yld U	Fife	As host farm crop	As host farm crop	As host farm crop	Feed
WO	701	Yld T & Yld U	East Midlands	As host farm crop	2nd cereal preferred	Medium/heavy	Milling
WO	703	Yld T & Yld U	Yorkshire & Humber	As host farm crop	2nd cereal preferred	As host farm crop	Milling
WO	704	Yld T & Yld U	Devon	As host farm crop	2nd cereal preferred	As host farm crop	Milling
WO	705	Yld T & Yld U	South East (Kent)	As host farm crop	2nd cereal preferred	As host farm crop	Milling
WO	706	Yld T & Yld U & Lodging	Northern Ireland	As host farm crop	2nd cereal preferred	As host farm crop	Milling
WO	707	Yld T & Yld U	Herts, Cambs, Beds	As host farm crop	2nd cereal preferred	As host farm crop	Milling
WT	427	Yld T & DOP	Southern or Eastern England	As host farm crop	As host farm crop	As host farm crop	As host farm crop
WW	501	Yld T & DOP	South Aberdeenshire/Angus	Sept-Oct	1st cereal	Not specified	Feed
WW	502	Yld T & DOP & Lodging	North Aberdeenshire	Sept-Oct	1st cereal	Not specified	Feed
WW	503	Yld T & Yld U	Angus/Fife	Sept-Oct	1st cereal	Not specified	Feed
WW	504	Yld T & Yld U & Lodging	East Lothians	Sept-Oct	1st cereal	Not specified	Feed



WW	505	Yld T & DOP	Scottish Borders	Sept-Oct	1st cereal	Not specified	Feed
WW	508	Yld T & Yld U	North Yorkshire/Durham	Sept-Oct	1st cereal	Not specified	Biscuit
WW	510	Yld T & DOP	East Yorkshire	Sept-Oct	2nd cereal	Not specified	Feed
WW	512	Yld T & Yld U	Mid Lincs	Sept-Oct	1st cereal	Not Wolds land	Bread
WW	513	Yld T & DOP	Mid-East Norfolk	Sept-Oct	1st cereal	Not specified	Feed
WW	514	Yld T & Yld U	West Norfolk	Sept-Oct	1st cereal	Deep silt	Biscuit
WW	516	Yld T & DOP	Lincs/Notts	Sept-Oct	1st cereal	Light	Feed
WW	522	Yld T & DOP	Kent	Sept-Oct	1st cereal	Not specified	Feed
WW	523	Yld T & Yld U	Shropshire	Sept-Oct	1st cereal	Not specified	Bread
WW	524	Yld T & DOP & Lodging	Leicestershire	Sept-Oct	1st cereal	Not specified	Bread
WW	526	Yld T & DOP & Lodging	West Midlands (not Shrops)	Sept-Oct	1st cereal	Not specified	Feed
WW	527	Yld T & Yld U	Hants	Sept-Oct	1st cereal	Not specified	Feed
WW	528	Yld T & Yld U	Devon	Sept-Oct	1st cereal	Not specified	Feed
WW	529	Yld T & DOP	Hants/Wilts/Dorset	Sept-Oct	2nd cereal	Not specified	Feed
WW	531	Yld T & DOP & Lodging	Northern Ireland	Sept-Oct	1st cereal	Not specified	Feed
WW	532	Yld T & DOP	Cheshire	Sept-Oct	2nd cereal	Not specified	Feed
WW	537	Yld T & Yld U	North Yorkshire (Vale)	Sept-Oct	1st cereal	Not specified	Feed
WW	538	Yld T & DOP	Sunderland	10 Sep-25 Sep	1st cereal	Not specified	Feed
WW	539	Yld T & Yld U	South Wales	Sept-Oct	1st cereal	Not specified	Feed
WW	541	Yld T & DOP	East Midlands, vegetable growing area	Nov-Jan	1st cereal	Light	Feed
WW	542	Yld T & DOP	West Norfolk, sugar beet growing area	Nov-Jan	1st cereal	Deep silt	Feed
WW	543	Yld T & DOP	Southern England relevant	Nov-Jan	1st cereal	Medium	Feed
WW	544	Yld T & DOP	Suffolk, sugar beet growing area	Nov-Jan	1st cereal	Medium-heavy	Feed
WW	545	Yld T & DOP	South Lincs, veg/beet growing area	Nov-Jan	1st cereal	Medium-heavy / deep silt	Feed

## Appendix 10 – Payments for abandoned or rejected trials

### AHDB Recommended List trials

#### Payments for abandoned or rejected trials or parts of a trial

Problem	Reason for failure or loss of data	Payment	
		Proportion of: Trial	Replicate
Trials abandoned before harvest			
Trial not drilled	Factors outside of the trial operator's control (e.g. weather).	25%	N/a
Trial not drilled	Controllable factors (e.g. missed opportunity to drill)	0%	N/a
Failed to establish	Factors outside of the trial operator's control (e.g. waterlogging where there is no history of any problem).	50%	50%
Failed to establish	Controllable factors (e.g. bird damage).	See note 1	0%
Abandoned mid-season	Excessive OSR volunteers in OSR trial if in an unsuitable rotational position (<5 yrs since OSR crop).	See note 2	25%
Abandoned mid-season	Excessive OSR volunteers in OSR trial if in a suitable rotational position (>5 yrs since OSR crop).		50%
Abandoned mid-season	Excessive cereal volunteers in 1st cereal trial.		25%
Abandoned mid-season	Excessive cereal volunteers in 2nd cereal trial.		50%
Abandoned mid-season	Factors outside of the trial operator's control (e.g. drought or waterlogging where there is no history of any problem).		50%
Abandoned mid-season	Controllable factors (e.g. excessive weeds or pest damage).	See note 3	25%
Trial not harvested (but all other work carried out)	No fault attributable to the trial manager.	See note 4	75 - 100%
Data unavailable	Incorrect treatment mid-season (trial operator or host farm error).	See note 4	50%

**Payment  
Proportion of:**

Problem	Reason for failure or loss of data		Trial	Replicate
Data unavailable or loss of accuracy.	Trial drilled with errors (e.g. laid out incorrectly, invalidating alpha lattice design) or by not following the plan correctly.	See note 5	TBC	TBC

Trials harvested but rejected for use in the database				
Data omitted	Factors outside of the trial operator's control (e.g. take all or drought)		100%	100%
Data omitted	Factors under the control of the operator at harvest.		50%	50%

Grain samples post-harvest				
Samples unavailable	Not taken or not received by testing laboratory		90%	N/a
Samples in poor condition	Samples not correctly dried.		90%	N/a

**Note 1** Controllable factors: This assumes that it has been possible to take corrective action but it has not been done. If the operator has been unable to take action due to (e.g.) weather the payment will be 50%.

**Note 2** Unless there has been written prior agreement to place trial on a site that has grown OSR <5 years ago.

**Note 3** This includes trials sown in a location that increases the risk of damage (e.g. too close to a wood or other potential sources of animal activity such as a badger sett).

**Note 4** If the trial inspector agrees that the trial should be taken to harvest then payment should be 100%. If the operator wishes to take the trial to harvest against the advice of the inspector, these payments apply.

**Note 5** A decision on payment for this problem can only be determined on a case by case basis, depending on the amount of data or accuracy lost.