



MBC PROTOCOL

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THE MBC PROTOCOL PROCEDURE

Introduction

The MBC (Malting Barley Committee) is the cross-industry body which manages the joint industry malting barley variety quality assessment system. The system has a long history (over 45 years) of working with UK cereal recommended list committees to identify and Approve varieties that are of interest to the malting, brewing and distilling industries of the UK. Originally managed by the IoB (Institute of Brewing) Barley Committee, the task migrated to the Malting Barley Committee (MBC) and the brand IoB Approved was changed to IBD Approved, to acknowledge the importance of distilling, and reflect the IoB's revised name. In 2018 the brand was changed to MBC Approved. Administration is now provided by the MAGB.

Throughout this period, the system has been characterised by:

- Participation covering the whole grain chain from breeder to brewer and distiller
- Participation based on members appointed by industry bodies; MAGB, SWA, BBPA and BSPB
- Willingness by competing businesses to work together in a transparent manner
- The production of decisions (Approvals) rapidly put into the public domain.

The Malting Barley Committee (MBC) and its subordinate Micromalting Group (MMG) operate this MBC system; the composition, objectives and operating system are described below.

Composition of Committees

The Malting Barley Committee comprises a Chair (stakeholder), Deputy/Vice-Chair and nominated stakeholders representing BBPA, MAGB and the SWA; it includes non-voting members drawn from BSPB, AHDB and AIC together with persons co-opted to assist the working of the committee.

The Micromalting Group comprises a Chair and Deputy/Vice-Chair appointed by the MBC and responsible for leading on Brewing and Distilling requirements, representatives from the contributing micro-malting laboratories, the AHDB data-handler and persons co-opted to assist the working of the committee, including SWRI and SRUC.

Membership details are revised annually and given in Appendix A

Operating system

The Malting Barley Committee (MBC) has a tiered committee system in managing the MBC Approval system.

THE MALTING BARLEY COMMITTEE (MBC)

Constitution

To administer the selection of new malting barley varieties and ensure adequate publicity.

The Malting Barley Committee is constituted with two members from each of the three funding bodies – MAGB, BBPA and SWA. The MBC may co-opt members from those parts of the malting, brewing and distilling industries responsible for purchases, technical advice or macro-scale testing; these members can vote on technical matters but not constitutional matters. The Committee is supplemented by one each from AIC (Seeds), AHDB and BSPB plus the Secretariat provided by MAGB. The MBC may co-opt others to assist their business; such members will be non-voting members on the MBC, BUT they may be asked to participate in discussion and vote on appeals. A vote will only be taken within the MBC when requested by one or more of the voting members.

The Chair will be from one of the funding bodies and will serve for two years, supported by a Deputy/Vice-Chair, who is Chair of the MMG. The Chair will not normally vote, but in the event of a tie has the casting vote.

To achieve sound decisions, it is important that the industries are properly represented at MBC meetings. Where an industry representative is unable to attend, an alternate should be present from the same stakeholder.

Terms of Reference

To administer a joint industry committee for the selection of new malting barley varieties and to ensure the continued supply of good quality raw materials for malting, brewing and distilling purposes.

Funding

In proportions 2:1:1 respectively from the three trade sources – MAGB, BBPA and SWA. Some of the MAGB commitment is in-kind, including the time and expenses of the staff member heading up the administration of the committee.

Issues

The Committee will have the authority to demonstrate acceptance of new and existing malting barley varieties by the award of an asterisk which signifies such approval. This is known as MBC Approval.

Publicity

- ❖ Newsletter/via AHDB
- ❖ Websites

Objectives

1. To administer a joint industry committee for the selection of new malting barley varieties and to ensure the continued supply of good quality raw materials for malting, brewing and distilling purposes.
2. To oversee the operations of the MBC Micromalting Group (MMG).

The System

MBC Provisional Approval (*1)

Three years of micromalting assessment lead to the decision on whether to award MBC Provisional Approval. The recommendations on data from the NL1 and NL2 are used to identify varieties meeting the AHDB criteria for candidate selection and provisional recommendation.

In reaching decisions for Provisional Approval, the MBC uses, not only the most recent recommendations of the MMG, but also data and recommendations from the previous two years. The MBC also takes account of wider commercial considerations such as whether the agronomic performance is sufficiently competitive and how the variety will compare with currently purchased varieties, i.e. has the variety potential to be used in significant tonnages by the industry.

Provisional Approval is granted separately for Brewing, Malt Distilling and Special Use. The special use category represents varieties that have unique traits, selected through the MBC evaluation process. The special use category represents varieties that are unlikely to command a large market share but are of importance to certain sectors and uses within the malting, brewing and distilling supply chain. Malting Barley Committee is the decision-making body.

Full MBC Approval (*)

Breeders are expected to be aware of progress under both the AHDB and MBC systems, such that commercial bulks should be available to maltsters from the harvest following first recommendation by AHDB for spring barley, and a year later for winter barley: these bulks are expected to meet normal commercial specifications. The detailed Procedure for macroscale trials is given in Appendices B and E. To achieve Full Approval requires a specified number of satisfactory results in commercial maltings, breweries and/or distilleries (Appendix B). Approvals are dealt with separately for brewing and distilling, each requiring tonnages likely to be in excess of 1000t. For varieties considered for special use, testing follows the procedure detailed in Appendix B and may lead to varieties being successfully recommended for special use.

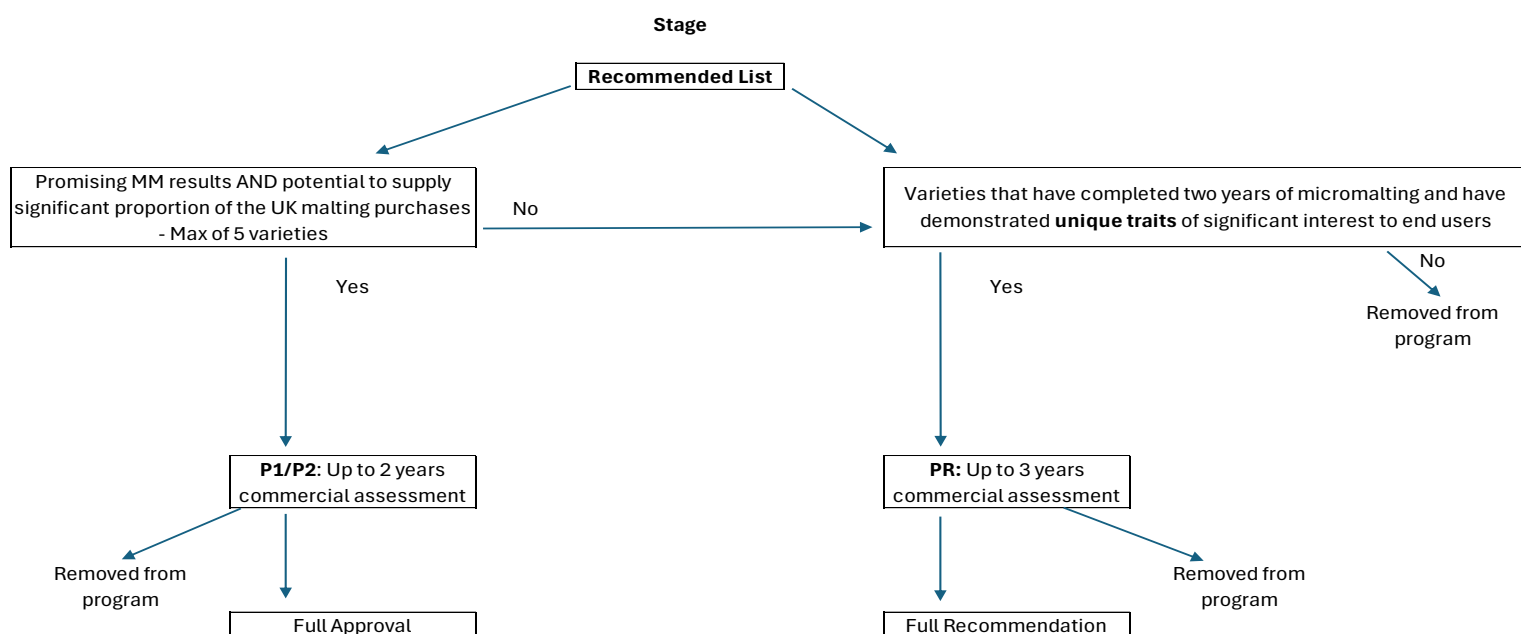
It is important to understand that these macroscale tests are **not** under the control of the MBC. They rely on a breeder/agent allocating sufficient seed to growers to produce the required bulks that meet normal malting specifications. In most cases the breeder/agent not only makes arrangements for growing the bulk but also identifies a maltster to carry out the

macroscale malting. In most cases the maltster will identify a brewer or distiller to complete the testing for that specific bulk. The MBC, and the Secretariat, have a role **assisting** this process, checking that breeders are aware which varieties may be needed for macroscale trials, checking what bulks have been produced, that plans are in hand for the macroscale tests and receiving the reports based on the MBC forms (see Appendix E).

For varieties considered for special use, the existing trials form will be reviewed for sufficient applicability by the MBC before use. The results from macroscale trials are evaluated by the MBC and decisions taken on progress within the MBC Approval system.

Unless a new variety is assessed by the malting, brewing and distilling industries as having the potential to have a significant commercial future, then it is unlikely there will be volunteers to carry out the macroscale malting, brewing and distilling tests. These tests are expensive to conduct and there are relatively few businesses able and willing to conduct the tests and complete the reporting requirements. Where a variety fails to complete macroscale testing within the timeframe shown in Appendix B, it automatically fails to have a place on the MBC Approved List.

Variety Progression Process Flow



Appendix B in the MBC Protocol details the requirements for a variety to progress through the stages, this process flow is to demonstrate the routes.

P1/P2 = Provisional Approval 1 or 2

PR = Provisional Recommendation for Special Use

THE MICROMALTING GROUP (MMG)

The analytical work is carried out by the Micromalting Group (MMG): it draws on expertise for both brewing and distilling and makes recommendations based on the technical micro-malting data. See Appendix B for detailed description.

Objectives:

1. To produce barley and micromalting data on the potential of new barley varieties for use in the malting, brewing and distilling industries.
2. To examine the data, correct errors and remove outliers that might damage the integrity of the database, including judging whether the grain nitrogen content and germination data are within a commercially acceptable range.
3. To compare the performance against chosen controls in order to make recommendations to the MBC on suitability for malting, brewing and distilling.
4. To revise the analytical protocol as needed and maintain a degree of uniformity across labs.

The system

Samples from BSPB National List and AHDB Recommended List trials are analysed by the Micromalting Group to produce data using the Protocols/Procedures listed in Appendix B. The Protocol is revised when appropriate at the MMG meeting and checked for uniformity across laboratories using standard samples analysed by all laboratories, if thought appropriate.

The decision on which varieties to test rests with breeders at VL1. At VL2 it is normally restricted to those varieties selected as candidates for Recommended List trials by AHDB. Varieties tested from RL1 are normally restricted to those entering their first year of recommendation by AHDB. Controls are selected to provide comparison and continuity using the National List controls; occasionally an additional control is needed. Sample selection is co-ordinated by AHDB both in respect of sites and varieties. Trial site managers are instructed by AHDB in the selection of sites, varieties, sample handling and submission to the selected testing laboratory.

Micromalting data from the co-operating labs are submitted to AHDB for processing after preliminary checking by the Chair or deputy. The data is issued ahead of the annual MMG meeting (normally April) so that labs can recheck their data.

The data sheets use various statistical techniques to identify outliers; these may be lab results which differ from results from other labs, or a variety result that differs from other results for the same variety. It is important to check whether differences in lab results are based on samples from the same site or samples from different sites. At the MMG, outliers are considered and where appropriate deleted from the database. The corrected data are then rerun to produce revised summary sheets.

The MMG uses the revised summaries to rank test varieties:

GREEN (better than controls)

AMBER (as good as controls)

RED (not as good as controls).

The means for key characters are examined against the controls and colour-coded. To facilitate this task, the table is presented in descending order of Hot Water Extract for brewing, and descending order of Predicted Spirit Yield for distilling. The MMG needs to decide and minute which site controls are used for this evaluation. There may not be any relevant controls for varieties under consideration for special use, but these varieties may still be classified as amber by the MMG.

Once the key characteristics have been colour-coded, the varieties are given separate GREEN, AMBER or RED rankings for brewing, malt distilling and special use.

The revised means with the MMG recommended colour-coding for brewing and distilling potential, together with the minutes, form part of the Agenda at the subsequent meeting of the MBC; these are presented by the Chair or Deputy of the MMG.

The revised means form the data-set on which discussions and decisions are based. Once the revised data-set has been cleared by the Chair or Deputy Chair, a copy should be sent to BSPB ahead of the MBC meeting. [See page 8 for Appeals.](#)

The source data providing results from individual lab results will not be divulged; that is part of the agreement between MBC and the contributing labs. A breeder may ask AHDB or the appropriate MMG Chair to recheck the source data ahead of the MBC meeting.

	<u>MBC Variety Assessment</u>	<u>MBC Support at the AHDB BOOCC</u>
VL1/VL2/RL	Extract / PSY better than controls, no red flags	Support if higher than yield target Support if lower than yield target by less than <0.5%
VL1/VL2/RL	Extract / PSY same as controls, possible red flag on other quality parameter	Support if higher than yield target by 0.5% No Support if <0.5% higher than the yield target
VL1/VL2/RL	Extract / PSY worse than controls, red flag on other quality parameter	No Support

COMMUNICATING DECISIONS

Data summaries and MMG recommended rankings are sent to BSPB ahead of the summer MBC meeting.

Communication between the MBC and AHDB's Barley and Other Crops' Committee (BOOCC) is achieved as follows:

The micromalting database is held and updated by AHDB; any revisions to the colour-coding will be recorded by the AHDB staff member attending the MBC meeting. This includes any changes to the colour-coding of candidates. Those who sit on both the MBC and BOOCC should be prepared to provide supporting explanation. The BSPB Secretariat representative attending the MBC should communicate information on those varieties exiting the IBD Approval system, or any other decisions involving demotion.

Decisions on progress within the MBC Approval system are published in a press release and circulated to appropriate stakeholders.

APPEALS

BSPB are responsible for passing MMG summaries and recommendations to the breeders. If a breeder wishes to query either the data or the recommendation, they should contact the Chair of the MMG. If it is a data issue, the Chair should check the source data, review what was done by the MMG, respond to the breeder and inform the MBC if a revision should be made. If the breeder is unhappy with the response, they should 'appeal' to the MBC, providing a short rationale for their appeal ahead of the MBC meeting, to both the MBC secretary and the BSPB representative. Queries about recommendation follow a similar path. The Chair should check for consistency the summary on which the recommendation was based, respond to the breeder and inform the MBC if a revision should be made. If the breeder is unhappy with the response, they should appeal to the MBC, providing a short rationale ahead of the MBC meeting to both the MBC secretary and the BSPB representative. Appeals against the MMG dataset or recommendations will be taken by the MBC before discussion leading to MBC decisions. The MBC's decision on these appeals will be final.

For Appeals against other MBC decisions, a small group (at least three) will be nominated at the start of the MBC meeting. These members **may** contribute to the initial discussions but **must not** participate in the actual decision-making process. The Appeal Group will be chaired by someone who is technically knowledgeable, normally the Chair or Deputy Chair of the MMG. The other two members should ideally be drawn from non-voting members of the MBC.

MBC decisions leading to a downgrade in a variety's progress should be reported to the breeder by the BSPB Secretariat representative early in the lunch break. The BSPB representative may give guidance to the breeder on the factors/discussion leading to that decision. If the breeder wishes to appeal, a short rationale for the appeal should be emailed back to the BSPB Secretariat representative in time for the appeal to be presented to the Appeal group for consideration after the lunch break.

The normal grounds for appeal are INCONSISTENCY or FAILURE TO CONSIDER ADEQUATELY THE INFORMATION AVAILABLE TO THE MBC. If the appeal is of a technical or commercial nature it will be referred back to the next meeting of the MBC. The decisions of the Appeal group will be final.

APPENDIX A COMPOSITION OF COMMITTEES

Members of the Malting Barley Committee

The Malting Barley Committee is formed of the following members:

- 2 x MAGB reps
- 2 x SWA reps
- 2 x BBPA reps
- 1 x MMG – Chair with V-C as alternate, no requirement for both to attend
- 1 x MAGB rep on AHDB BOOCCC
- 1 x AHDB rep
- 1 x SRUC rep
- 1 x NIAB rep
- 1 x BSPB – to represent, feed back issues/requests from breeders.

Confidentiality of trial reports must be maintained.

- 1 x AIC Seeds Cttee rep
- 1 x IBD rep
- 1 x MAGB Secretariat
- 1 x co-opted industry member

Members of the MBC Micromalting Group

The MBC Micromalting Group is formed of the following members:

- 2 x MAGB reps (Chair and Vice-Chair)
- 1 x rep from each industry laboratory contributing data to the Group
- 1 x NIAB rep
- 1 x SRUC rep
- 1 x SWRI rep
- 2 x AHDB reps

APPENDIX B PROTOCOLS AND PROCEDURES

Procedure for MBC Approval

1. Criteria for MBC Provisional Approval or Recommendation for Special Use

- Varieties are assessed for three years in the RL system. Candidates for Provisional Approval will be selected from those varieties in UK Recommended List trials with promising VL1 and VL2 micro-malting results and the potential to supply a significant proportion of UK malting industry purchases.
- Provisional Approval 1 will be awarded to those varieties that demonstrate useful malting quality in micro-malting tests following the first Recommended List trial harvest.
- For winter varieties only, Provisional Stage 1 Approval will be given after RL1 where the data are strong with borderline varieties being assessed again a year later using additional data from the RL2 harvest. Once a decision has been made to delay consideration for Approval the variety will only be considered at its due date.
- Varieties with unique traits considered for special use will be assessed via appropriate micro and macro scale assessments during the evaluation process. During the evaluation process, these varieties will have 'Provisional Recommendation for Special Use'.

2. Criteria for MBC Full Approval

- Candidates for Full Approval will have been awarded Provisional Approval 1 based on micro-malting results. To gain Full Approval the Malting Barley Committee must have evidence of satisfactory commercial performance in the maltings/brewery/distillery. Each year a maximum of 5 varieties will be chosen for commercial scale trials, no more than 2 of which will be Winter varieties. A minimum of 1000 tonnes of barley needs to be made available per test in order for sufficient trials to be carried out to enable a variety to proceed from Provisional Approval 1 to Full Approval in a single crop year. If a variety is to be trialled for both brewing and distilling, then a minimum of 2000 tonnes is required.
- Wherever possible the barley available for testing should have nitrogen content of:
Brewing 1.55 – 1.75%
Distilling maximum 1.65%
- In order to ensure a variety has the best opportunity of gaining Full Approval within the required timescale trial, barley should be in store and dried by the end of September. This will then enable maltsters to complete their trials by the end of January and Brewers/Distillers to complete the trials by the beginning of May.
- Multiple trial data from individual brewers/distillers may be admissible providing each trial is performed through a different process system (i.e. mash tun, lauter tun or mash filter).

- For Brewing and Malt Distilling approval, data from a suitable control variety must be submitted with each trial result. It is preferable that a spring barley variety should be tested against another spring barley and likewise with a winter variety.
- Satisfactory micro-malting results should be confirmed by a minimum number of satisfactory macro trials.

Macro Trials:

For Full Approval for Brewing Use

2 commercial malting and 2 different brewing trials (at least one of which must be a mash filter) with MBC preference for a combination of both mash filter trials and mash/lauter tun trials.

For Full Approval for Distilling Use

2 commercial malting and distilling trials

For Recommendation for Special Use

For grain distilling: 2 high DP commercial malting trials plus 1 acceptable test report by SWRI.

For others: 2 commercial malting and either brewing or distilling, as appropriate.

- The Malting Barley Committee wishes to confirm that two macroscale malting trials are acceptable from the same company, if using two separate maltings and the same barley bulk; or if using two different barley bulks within the same maltings. However, this is an exception, to be used in exceptional circumstances only and is not to become the norm.
- A variety should normally progress to Full Approval with one year of commercial trials. Where there have been insufficient satisfactory malting, brewing or distilling trials to award Full Approval in one year of commercial trials, the Malting Barley Committee may award Provisional Approval 2 to denote that a variety has not been rejected and is still progressing through the approval process. Macro-scale data from out with the UK can provide secondary evidence to back up the primary evidence from UK macro-scale trials.
- A variety should progress to Full Approval within two years of commercial trials. Any variety failing to gain Full Approval within two years will be removed from the List.
- The Malting Barley Committee considers macroscale trial reports at its Spring and Autumn meetings. It reserves the right to hold an extraordinary additional meeting to consider late submissions of trial reports if made aware of such trials at either of the regular meetings. If required, an extraordinary meeting will be held no later than 6 weeks after the Spring or Autumn meeting.
- The Malting Barley Committee may consider for Provisional and Full Recommendation, varieties with special qualities, providing that they demonstrate satisfactory (but not necessarily the best) malting and brewing/distilling performance in all respects.
- The Malting Barley Committee may use its absolute discretion with regard to awarding of Approval, which might under circumstances override the above criteria.

3. Varieties considered for Recommendation for Special Use

- The Malting Barley Committee may consider for recommendation as those of Special Use, varieties with unique traits, providing that they demonstrate satisfactorily (but not necessarily the best) malting and brewing/distilling performance in all respects.
- Candidates for Special Use will have completed two years of micromalting and have demonstrated unique traits of significant interest to end users.
- A candidate variety should progress to fully recommended for Special Use within three years of evaluation. Any variety failing to gain sufficient support from industry within three years will be removed from the special use category.
- Candidate varieties under assessment for recommendation for Special Use may be considered against data from a suitable control should the MBC decide there is a relevant control variety.
- The MBC will decide, at its' sole discretion, if a Macro scale Malting and End User trial should take place as part of the recommendation process within the 3 years evaluation period. If there is to be a macro scale trial the MBC will also decide if there should be an appropriate control.
- The Malting Barley Committee may use its' absolute discretion, with regard to awarding of recommendation, which might under circumstances override the above criteria.

4. Criteria for Removal from the List of MBC Approved Varieties

- Varieties may be removed from the MBC Approved List when, at the discretion of the Malting Barley Committee, the Approved or Provisionally Approved variety no longer warrants promotion by the industry. Equally, varieties may be removed from the special use category whilst provisionally recommended or fully recommended.
- Criteria for removal may include insufficient commercial scale trials, poor or outclassed performance, low purchases or lack of seed availability.

MBC Micromalting Group (MMG) – Brewing and Distilling Evaluation

Testing Protocols for Barley and Malt Samples

1. Sample Reception and Barley Analysis

1.1 Sample Distribution and Receipt:

The trial sites should dispatch the samples immediately after drying so that the trial material is received by participating laboratories in November/December. Contractors should notify participating laboratories that the samples have been dispatched. All samples should be identified by the AFP Number.

1.2 Screening Tests:

When received, each barley sample should first be analysed for corn size distribution, using a barley grader (e.g. Glasblaserei or Sortimat) having slotted sieves of 2.8mm, 2.5mm and 2.2mm. The results to be recorded as follows:

- i) Corns >2.8mm (%) = weight of grain retained on 2.8 mm sieve
- ii) Corns >2.5mm (%) = weight of grain retained on 2.5mm sieve plus weight of grain retained on 2.8mm sieve
- iii) Corns <2.2mm (%) = weight of all grain that passes through 2.2mm sieve

Once the screening tests have been completed the entire sample should then be dressed over the 2.2mm screen and all material <2.2mm discarded. This screened sample should be used for subsequent barley analysis and micromalting.

1.3 Barley Analysis:

The screened barley sample (>2.2mm) should be analysed for the following:

- i) Moisture % (3.2)*
- ii) Thousand Corn Weight (g), dm (3.4)*
- iii) Total Nitrogen (Dumas) % dm (3.3.2, Dumas)*
- iv) % Skinning
- v) Pre-germination (record this only if entries are obviously pre-germinated)

* Analytica-EBC reference methods of analysis

A visual examination of the screened barley should also be recorded (e.g. splits, loose husk, lost embryos and mould etc)

The following germination tests should be done on each sample just prior to malting (ca one week) and recorded as cumulative counts at 72hrs:

- i) Germinative Energy / Water sensitivity, 4ml and 8ml tests (3.6.2)*
- ii) Germinative Capacity Test (Peroxide)

N.B: Where possible the barley samples should be stored at 18 - 20°C to promote dormancy recovery prior to malting.

1.4 Dormancy Testing:

- i) Dormancy monitoring will be conducted by the NIAB
- ii) Dormancy Testing should be done only on NL barleys
- iii) The data is to be forwarded to the Chairman of the MMG as soon as the results are available.

2. Micromalting

2.1 General Conditions – Sample Preparation and Processing

- i) The AHDB will issue updated lists detailing which varieties from the NL trials need micromalting.
- ii) Use the screened barley sample (>2.2mm) for micromalting.
- iii) Ensure that micromalting conditions do not vary from run to run.
- iv) Do not attempt to optimise micromalting conditions for each variety.
- v) Each variety should receive the same steeping, germination and kilning cycles suitable for each malt type.
- vi) Process cycles should reflect commercial practice (i.e. a two or three water steeping regime)
- vii) The use of process additives, such as Gibberellic Acid, is prohibited,

2.2 Steeping

The grain should be steeped to target the following cast moistures depending on the malt type:

- | | | |
|-----|-------------------------------------|-----------|
| i) | Brewing and Distilling malt | 44 - 46 % |
| ii) | Grain Distilling (high enzyme malt) | >48% |

A two or three steep water regime should be used to achieve these moisture levels and temperature may be in the range 12 – 18°C. Up to 48hrs should be allowed for the steeping stage.

Record the cast moisture a suitable time after the last steep, e.g. 24hrs from casting. Record the steep cycle used and process conditions.

Sufficient grain should be steeped to allow full malt analysis to be carried out.

2.3 Germination

A nominal germination time of 96hrs should be employed and no processing aids should be used.

Total wet processing time (i.e. steep time + germination time) should not exceed 144hrs.

The normal germination temperatures for the particular micromalting system in use should be employed i.e. typically in the range 12 – 18°C.

Additional comments may be made e.g. grain mouldy, uneven growth etc.

Record the load moisture prior to kilning.

2.4 Kilning

The malt should be dried to typical moisture levels appropriate for each malt type ie:

- i) For brewing and distilling malts kiln at 60 – 70°C as per a lager or distilling malt. The final moisture should be 3.5 – 5.0%, target 4.0 – 4.5%.

3. Malt Analysis

Analysis of final micromalted samples should be tested according to the appropriate malt type as follows:

Reference Method Analytica-EBC	Test Parameter	B	D
4.2	Malt Moisture (%)	✓	✓
4.7.2	Wort colour (EBC units)	✓	✓
4.6.1	HWE ₇ (% soluble, dry)	✓	✓
4.6.1	HWE ₇ (l°kg ⁻¹ dry)	✓	✓
4.3.2	TN (% dry)	✓	✓
4.9.3	TSN (% dry)	✓	✓
-	SNR	✓	✓
4.10	Wort FAN (mg l ⁻¹)	✓	✓
4.11.3	UNBOILED Fermentability (%)	-	✓
4.11.3	Fermentable Extract (%, dry)	-	✓
-	Predicted Spirit Yield (litre/tonne, dry)	-	✓
4.12	DP °loB (as is)	✓	✓
4.13	Alpha amylase (DU)	✓	✓
4.8	Wort Viscosity (mPas)	✓	✓
4.16.2	Wort β-glucan (mg l ⁻¹)	✓	✓
4.15	Friability (%)	✓	✓
4.15	Homogeneity (%)	✓	✓
4.15	Whole Corns (%)	✓	✓
4.21	Glycosidic Nitrile (ppb extract)	-	✓

B* denotes required tests for brewing

D* denotes required tests for distilling

Where appropriate methods of analysis should be derived from Analytica-EBC reference methods.

Results should be reported on the basis of 450g mash where applicable.

MMG members are expected to take part in the MAPS proficiency scheme and are responsible for their own laboratory precision.

Note the GN testing regime for Distilling Malts:

- GN analysis is not required on the non-producers at VL1
- GN analysis is required on non-producers at VL2
- GN analysis is optional on varieties at RL

4. Reporting of Results

Results for the barley analysis, the malting conditions and the malt analysis should be recorded on the electronic reporting data sheets provided by the AHDB. Note that the reporting sheet is formatted to allow results to be displayed to the correct precision.

The reporting spreadsheets should not be amended by individual participants as the format is designed for ease of data transfer to the AHDB statistical data pack. Column positions or test header descriptions should not be changed. Where results are not available then data cells should be left blank. It is important that zeros should not be entered.

The submission deadline for data will be advised by AHDB.

Data must be reported electronically via e-mail to the RL & Agronomy Trials Data Analyst and to Chair of the MMG.

The data on trial barleys should be sent to the appropriate personnel within the AHDB:

- Ellie.Marshall@ahdb.org.uk
- trials@ahdb.org.uk

APPENDIX C MBC TEMPLATE AGENDAS

THE MALTING BARLEY COMMITTEE – SUMMER MEETING

The next meeting of the Malting Barley Committee to be held
at..... on

AGENDA

1	Welcome	
2	Apologies for Absence	
3	Committee Membership Circulate current list during meeting and request amendments	
4	Declarations of Interest	
5	Minutes of last Meeting (attached)	
6	Matters arising (not covered in the Agenda)	
7	Reports a) SRUC Crop Report b) NIAB Report c) MAGB Collation of Final Barley Purchases from Harvest (YEAR) d) AHDB Barley Committee	
8	Micromalting Group report a) Main points/issues raised at the MMG meeting b) Review of micromalting data i. RL varieties ii. VL2 varieties iii. VL1 varieties c) Identification of potential Malt Distilling Varieties d) Identification of potential varieties for Special Use e) Identification of potential Brewing Varieties f) Candidates for Provisional Approval (1) g) Candidates for recommendation for Special Use h) Confirm arrangements for micromalting work from (YEAR) harvest MBC decision requirement To consider the recommendations for new Provisional Approvals	
9	Malt Distilling Macroscale Trials from (last) Harvest Candidates: a) Review commercial scale malting and distilling trials b) Decide promotions to Provisional (2) or Full Approval	
10	Special Use Macroscale Trials from (last) Harvest Candidates: a) Review commercial scale malting and distilling trials b) Decide promotions to Provisional (2) or Full Approval	
11	Brewing Macroscale Trials from (last) Harvest Candidates: a) Review commercial scale malting and brewing trials	

	b) Decide promotions to Provisional (2) or Full Approval	
12	MBC Approved List for Harvest (15 months' time) a) Decide on candidates for removal from the List b) Review list taking into account decisions at 7, 8, 9 10 above	
13	Macroscale trials plan varieties from forthcoming Harvest a) To review arrangements for macroscale trials from next harvest b) To consider varieties and their availability for macroscale trials c) Review protocol for supply of trial material	
14	Review of MBC Protocol	
15	Any Other Business	
16	Date and Venue for next meeting	

THE MALTING BARLEY COMMITTEE-AUTUMN MEETING

**The next meeting of the Malting Barley Committee to be held
at on**

AGENDA

1	Welcome	
2	Apologies for Absence	
3	Membership (attached) Circulate current list during meeting and request any amendments	
4	Declarations of Interest	
5	Minutes of the last Meeting – (attached)	
6	Matters arising (not covered in the Agenda)	
7	Reports a) NIAB Harvest Report and Choice of Trial Plot Sites b) SRUC Harvest Report c) Micromalting Group d) Collation of (YEAR) Interim Barley Purchases e) Report from AHBD Barley Meeting – Progression of varieties f) Micro-Malting Group to include future data-handling	
8	Review and Decisions a) Consider varieties completing two years of Provisional Approval b) Review MBC Approved list c) Review MBC Special Use list d) Update stairway to heaven e) Plan for macro-scale trials from recent harvest – review arrangements f) Advice to AHDB Barley Committee on recommendation decisions g) Candidates for micro-malting trials from recent harvest	
9	Any Other Business	
10	Date & Venue of next year's Meetings: (propose) Summer Autumn	

APPENDIX D MBC APPROVED LIST AND 'STAIRWAY TO HEAVEN'



UPDATE TO MBC APPROVED LIST HARVEST (YEAR)

The Malting Barley Committee held its Autumn (YEAR) meeting to discuss the progress of new varieties within the testing system, and to review the commercial position of existing approved varieties.

The outcome was XXXXX

Please note that the award of Full or Provisional Approval to a variety does not infer immediate acceptance for use by all malting, brewing and distilling companies. Growers are advised to seek further information from their customers before sowing newly listed varieties.

For regional and agronomic information on malting barley varieties the current AHDB Recommended List should be consulted.

The updated MBC Approved List, incorporating the changes described above, is given below:

MALTING BARLEY COMMITTEE APPROVED LIST HARVEST (YEAR)

	Winter Varieties for Brewing Use	Spring Varieties for Brewing Use	Spring Varieties for Malt Distilling Use	Varieties Recommended for Special Use
Full Approval/ Recommendation	XXXXX	XXXXX	XXXXX	XXXXX
Provisional Approval 2		XXXXX		
Provisional Approval 1	XXXXX		XXXXX	
Candidate for Special Use		XXXXX		



PROGRESS TO MBC FULL APPROVAL
POSITION OF VARIETIES UNDER TEST AT (DATE/YEAR)

F8 and F9 VL1 and VL2 Micro malt	F10 RL1 Micromalt	F11 RL2 Provisional Approval 1 Macroscale	>F11 Provisional Approval 2 Macroscale	>F11 Full Approval/ Recommendation Harvest YEAR In commercial use
				Xxxxx w B Xxxxx s B Xxxxx s D
				Special Use Harvest YEAR
				Xxxxx w D Xxxxx s G
			Xxxxx w B Xxxxx s B Xxxxx s BD Xxxxx s D	
		XXXXXX w B XXXXXX w SU XXXXXX s B XXXXXX s BD XXXXXX s D		
XXXXX w B XXXXX s B XXXXX s BD XXXXX s D	XXXXX w B XXXXX s B XXXXX s BD XXXXX s D			

VL1/VL2/RL1/RL2 = stage in official testing
F8/9/10/11 = stage in seed production

B = approved for brewing use
D = approved for malt distilling use
G = approved for grain distilling use
SU = approved for special use

s = spring variety
w = winter variety

APPENDIX E EXAMPLES OF MACROSCALE REPORTS

MBC NEW BARLEY VARIETY MALTING/DISTILLING TRIALS

MALTING TRIALS DATA

Please complete this form electronically and return to tracy@magb.org.uk or send hard copy: FAO: Tracy Lawton, MAGB, 1st Floor Exchange Business Centre, Water Lane, Newark, Notts, NG24 1HA

- Please provide details wherever possible.
- The control malt may be the mean of several batches of the control barley manufactured to the same target specification.
- For the test variety, please give an indication of the number of malt batches, tons per batch and total tons produced.

Name of Malting Company

Collaborating Distiller Company

	Trial	Control
Variety		
Origin of Barley (Specify Area)		
Crop Year		

1. BARLEY

1.1 Barley Quality	Trial	Control
Sample appearance (Good/Normal/Poor)		
Dormancy on intake (None/Abnormal/Persistent)		
Split corns % (None/Few/Many)		
Skinned corns % (None/Abnormal/Persistent)		
Pregermination % (None/Abnormal/Persistent)		
Any Other Comments		

1.2 Barley Analysis	Trial	Control
Moisture, %		
Total Nitrogen, % dry		
Germinative energy (4 ml / 5ml) 24/48/72 h %		
Germinative energy (8 ml) 24/48/72 h %		
Germinative capacity % (Stain or peroxide test)		
1000 corn weight, g dry		
Grading: > 2.8 mm % 2.5-2.8 mm % 2.2-2.5 mm % < 2.2 mm %		
Any other analyses / comments:		

2. MALTING

2.1 Target Malt Type/Grade

2.2 Steeping	Trial	Control
Batch size, tonnes		
Number of batches		
Steeping schedule (total hours; 2 wet/3 wet)		
Water temperature, °C		
Water uptake (Slow/Normal/Rapid)		
Moisture content on cast, %		
Processing aids GA rate, ppm.		
Comments:		

2.3 Germination	Trial	Control
First chit (Slow/Normal/Rapid : Even/Uneven)		
Germination time, hours		
Germination temperature profile, °C		
Uniformity of growth (Good/Normal/Poor)		
Moisture content on kiln loading, %		
Comments:		

2.4 Kilning	Trial	Control
Kilning regime (Temperature/time profile)		
Comments on Malt Appearance and Yield/Out-turn.		
Other Comments:		

2.5 IOB Malt Analysis Parameter	Units	Trial	Control
Variety			
Moisture	%		
Extract (Dry, 0.7mm or specify mill setting)	L°/kg		
Extract (Dry, 0.2mm)	L°/kg		
Fine/Coarse Difference (Specify mill settings)	L°/kg		
Colour	°EBC		
Boiled Wort Colour	°EBC		

Alpha Amylase	DU		
Diastatic Power	°IOB		
Free Amino Nitrogen	% dry malt		
Soluble Nitrogen	%		
Total Nitrogen	%		
S.N.R.	%		
Friability	%		
Homogeneity	%		
Wort Viscosity	mPas		
Wort β -Glucan	mg/litre		
S-Methylmethionine	mg/kg		
Fermentability (unboiled)	%		
Predicted Spirit Yield	L/t/as is		
Glycosidic Nitrile	g/t		
Other Malt Analyses			

2.6 Comments on Overall Malting Quality and Processability

3. CONCLUSION

The trial variety produced a quality of malt which was:

* BETTER THAN / AS GOOD AS / POORER THAN the control malt.

The variety is considered to be:

* BETTER THAN / AS GOOD AS / POORER THAN the control variety.

Is there a requirement for further assessment? *Yes / No

* Delete as appropriate

If there is a requirement for further work, please state why and what needs to be done.

.....

.....

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.....

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Signed Print

DateTele-mail.....

MBC NEW BARLEY VARIETY MALTING/DISTILLING TRIALS

DISTILLING TRIALS DATA

Guidelines

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- Please provide details wherever possible.
- Some details may be “commercially sensitive” – omit if necessary or replace with “conforms to profile” etc.
- It is essential that the trial and control barleys will be barleys sown in the same season; i.e. both Spring barleys or both Winter barleys (no mixed season).
- It is essential that the trial and control malts are both produced from barleys from the same harvest.
- The control batch may be the mean of several batches from the control malt variety distilled to the same target specification.
- For the test variety, please give an indication of the number of batches and total volume of spirit produced.

1. TRIAL INFORMATION

	Trial Barley	Control Barley
Distilling Company		
Distillery		
Malt Supplied by		
Variety		
Origin of Barley (Specify Area)		
Crop Year		
Malt Supplier		

2. DISTILLERY DATA

Malt analysis data provided by Maltster /Distiller (*delete as appropriate*)

2.1 IOB Malt Analysis Parameter	Units	Trial Malt	Control Malt
Variety			
Moisture	%		
Extract (dry, 0.7mm or specify mill setting)	1°/kg		
Extract (dry, 0.2mm)	1° /kg		
Fine/Coarse Difference (specify mill settings)	1° /kg		
Alpha Amylase	DU		
Diastatic Power	° IOB		
Free Amino Nitrogen	% (dry malt)		
Soluble Nitrogen	%		
Total Nitrogen	%		
S.N.R.	%		
Friability	%		
Homogeneity	%		
Wort Beta-Glucan	mg/l		
Wort Viscosity	mPas		
Fermentability (unboiled)	%		
Predicted Spirit Yield	Lalc/te (as is)		
Glycosidic Nitrile	g/te		

2.2 Milling	Trial	Control
Type of mill		
Gap Size (mm)		
Top		
Middle		
Bottom		
Conditioned (Yes/No)		
Grist Analysis (%)		
Husk		
Grits		
Flour		
Comments:		

2.3 Mashing	Trial	Control
Number of Mashers		
Mash Vessel Type		
Process (eg single temperature infusion, temperature programmed, number of waters, etc)		
Washback OG		
MTE (% or 1°/kg)		
(% of laboratory HWE 2 or 7)		
Washback Fill Time (min)		
Draft Analysis (% TAE)*		
Sparge (draft) Losses (%)*		
Comments:		

--

* these data are essential to evaluate whether all the potential HWE/SY has been recovered.

2.4 Fermentation*	Trial	Control
Yeast Type/Rate (kg/tonne)		
Setting Temperature (°C) (all fermentations)		
Fermentation Time (hours) (all fermentations)		
Comments:		

**where appropriate, state whether values quoted are distillery or laboratory derived
“shorts vs. longs” – define times, comment on differences*

2.5 Distillation	Trial	Control
Still heating type (eg. kettles, indirect steam)		
Wash Control/Behaviour (eg. sticking stills, build up of material on pans/ kettles)		
Comments:		

2.6 Spirit Yield	Trial	Control
Washback Spirit Yield (l alc/tonne, dry)		
Production Spirit Yield		

(l alc/tonne, dry)		
Comments (If there is an unexpected difference between the two then explanation is required):		

3. SUMMARY COMMENTS AND CONCLUSION

This section is crucial in presenting a headline summary of the performance of the trial variety compared to the control variety.

- Please consider for each of the process areas, and for the overall spirit yield, whether the trial variety was POORER, AS GOOD AS, or BETTER than the control variety (*only one assessment for each parameter can be selected*).
- Enter concise comments in the appropriate boxes to substantiate your assessment for each of the key parameters.

	Processability			Spirit Yield
	Mashing	Fermentation	Distillation	
POORER than Control				
AS GOOD AS Control				
BETTER than Control				

Signed

Print

Date

e-mail

MBC NEW BARLEY VARIETY MALTING/BREWING TRIALS

MALTING TRIALS DATA

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- Please provide details wherever possible.
- The control malt may be the mean of several batches of the control barley manufactured to the same target specification.
- For the test variety, please give an indication of the number of malt batches, tons per batch and total tons produced.

Name of Malting Company

Collaborating Company

	Trial	Control
Variety		
Origin of Barley (Specify Area)		
Crop Year		

1. BARLEY

1.1 Barley Quality	Trial	Control
Sample appearance (Good/Normal/Poor)		
Dormancy on intake (None/Abnormal/Persistent)		
Split corns % (None/Few/Many)		
Skinned corns % (None/Abnormal/Persistent)		
Pregermination % (None/Abnormal/Persistent)		
Any Other Comments:		

1.2 Barley Analysis	Trial	Control
Moisture, %		
Total Nitrogen, % dry		
Germinative energy (4 ml / 5ml) 24/48/72 h %		
Germinative energy (8 ml) 24/48/72 h %		
Germinative capacity % (Stain or peroxide test)		
1000 corn weight, g dry		
Grading: > 2.8 mm % 2.5-2.8 mm % 2.2-2.5 mm % < 2.2 mm %		
β-Glucan content %		
Any other analyses / comments:		

2. MALTING

2.1 Target Malt Type/Grade

2.2 Steeping	Trial	Control
Batch size, tonnes		
Number of batches		
Steeping schedule (total hours; 2 wet/3 wet)		
Water temperature, °C		
Water uptake (Slow/Normal/Rapid)		
Moisture content on cast, %		
Processing aids GA rate, ppm.		
Comments:		

2.3 Germination	Trial	Control
First chit (Slow/Normal/Rapid : Even/Uneven)		
Germination time, hours		
Germination temperature profile, °C		
Uniformity of growth (Good/Normal/Poor)		
Moisture content on kiln loading, %		
Comments:		

2.4 Kilning	Trial	Control
Kilning regime (Temperature/time profile)		
Comments on Malt Appearance and Yield/Out-turn:		
Other Comments:		

2.5 IOB Malt Analysis Parameter	Units	Trial	Control
Variety			
Moisture	%		
Extract (Dry, 0.7mm or specify mill setting)	L°/kg		
Extract (Dry, 0.2mm)	L°/kg		
Fine/Coarse Difference (Specify mill settings)	L°/kg		
Colour	°EBC		
Boiled Wort Colour	°EBC		

Alpha Amylase	DU		
Diastatic Power	°IOB		
Free Amino Nitrogen	% dry malt		
Soluble Nitrogen	%		
Total Nitrogen	%		
S.N.R.	%		
Friability	%		
Homogeneity	%		
Wort Viscosity	mPas		
Wort β -Glucan	mg/litre		
S-Methylmethionine	mg/kg		
Other Malt Analyses			

2.6 Comments on Overall Malting Quality and Processability

3. CONCLUSION

The trial variety produced a quality of malt which was:

* BETTER THAN / AS GOOD AS / POORER THAN the control malt.

The variety is considered to be:

* BETTER THAN / AS GOOD AS / POORER THAN the control variety.

Is there a requirement for further assessment? *Yes / No

* Delete as appropriate

If there is a requirement for further work, please state why and what needs to be done.

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Signed Print.....

Date Tel e-mail.....

MBC NEW BARLEY VARIETY MALTING/BREWING TRIALS

BREWING TRIALS DATA

Guidelines

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- It is essential that the trial and control barleys will be barleys sown in the same season; i.e. both Spring barleys or both Winter barleys (no mixed season).
- It is essential that the trial and control malts are both produced from barleys from the same harvest.
- The control batch may be the mean of several batches from the control malt variety brewed to the same target specification.

1. TRIAL INFORMATION

	Trial Barley	Control Barley
Brewing Company		
Brewery		
Malt Supplied by		
Variety		
Origin of Barley (Specify Area)		
Crop Year		
Malt Supplier		
Type of Brew (Ale, lager etc.)		
Number of brews @ 100%		
Cereal Adjuncts used?		
Brewing Sugars used?		

2. BREWERY DATA

Malt analysis data provided by Maltster /Brewer (*delete as appropriate*)

2.1 IOB Malt Analysis Parameter	Units	Trial Malt	Control Malt
Variety			
Moisture	%		
Extract (dry, 0.7mm or specify mill setting)	1°/kg		
Extract (dry, 0.2mm)	1° /kg		
Fine/Coarse Difference (specify mill settings)	1° /kg		
Colour	°EBC		
Boiled Wort Colour	°EBC		
Alpha Amylase	DU		
Diastatic Power	° IOB		
Free Amino Nitrogen	% (dry malt)		
Soluble Nitrogen	%		
Total Nitrogen	%		
S.N.R.	%		
Friability	%		
Homogeneity	%		
Wort Beta-Glucan	mg/l		
Wort Viscosity	mPas		
S-Methylmethionine	mg/kg		

Please add any analyses that are considered important to the individual process of the Brewery concerned in the trial.

2.2 Milling	Trial		Control
Type of mill			
Gap Size (mm)			
Top			
Middle			
Bottom			
Conditioned (Yes/No)			
Grist Analysis (%)			
Husk			
Grits			
Flour			
Comments:			

2.3 Mashing and Mash Separation	Trial	Control
Mash Temperature Profile °C		
Liquor: Grist Ratio litres/kg		
β-Glucanase Additions litre/tonne		
Run-off Time (mins)		
Number of Rakes		
Clarity of Wort		
Gravity of Last Runnings		
Comments:		

Please add any observations that are considered important to the individual process of the Brewery concerned in the trial.

2.4 Boiling	Trial	Control
Boil time		
Evaporation rate		
Copper finings rate / time of addition		
Hot break description		
Cold break description		
Comments:		

2.5 Whirlpool & Wort Cooling	Trial	Control
Whirlpool stand time		
Trub appearance / description		
Wort pH		
Volume collected in FV		
Gravity in FV		
Brewhouse Extract Yield %		
Comments:		

2.6 Fermentation	Trial	Control
Type of vessel		
Yeast pitching rate		
Please attach fermentation gravity / temperature profile		
Comments:		

2.7 Cask Beer Fining Performance	Trial	Control
Clarity		
Time to drop bright		
Amount of bottoms		
Comments:		

2.8 Conditioning & Filtration	Trial	Control
CT clarity		
Filtration performance		
Shelf-life stability		
Comments:		

2.9 Beer Analysis	Trial	Control
Original gravity		
Present gravity		
Fermentable residue		
Alcohol content %v/v		
pH		
Colour, °EBC		
Bitterness, EBU		
Taste		

Please add any analyses that are considered important to the individual process of the Brewery concerned in the trial.

4. SUMMARY COMMENTS AND CONCLUSION

This section is crucial in presenting a headline summary of the performance of the trial variety compared to the control variety.

- Please consider for each of the process areas, and for the overall spirit yield, whether the trial variety was POORER, AS GOOD AS, or BETTER than the control variety (*only one assessment for each parameter can be selected*).
- Enter concise comments in the appropriate boxes to substantiate your assessment for each of the key parameters.

	Processability				
	Mashing	Boiling	Fermentation	Filtration	Cask Action
POORER than Control					
AS GOOD AS Control					
BETTER than Control					

Signed

Print

Date

e-mail