

Australian Malting Barley Centre – Current And Future Roles

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Abstract

An industry-funded national malting barley centre has recently been established at the Farming Systems Institute, Department of Primary Industries, Toowoomba, Queensland. The Centre, known as the Australian Malting Barley Centre (AMBC), utilises both the facilities and expertise of the Institute's Barley Quality Laboratory. However, operations of the AMBC are totally independent of this laboratory. Currently AMBC plays roles in regional and national barley research programs by (i) comparing the malting quality of promising lines emerging from all regional barley breeding programs, and (ii) providing a pilot malting service to industry. These together with other proposed future roles will see the Centre functioning as a market-orientated facility for the benefit of the Australian malting barley and brewing industries.

Introduction

The concept of a national malting barley evaluation centre was proposed by Armitt (1991) in a landmark paper delivered at the Grains 2000 Conference. The author suggested that the future of the Australian malting barley industry depended upon the:

- (i) establishment of a coordinated national malting barley breeding program,
- (ii) establishment of a national malting barley evaluation centre,
- (iii) establishment of a single export malting barley marketing authority,
- (iv) establishment of uniform grading standards for malting barley,
- (v) segregation of malting barley into two protein categories, and
- (vi) creation of a larger pool for malting barley.

So far, two of these issues have been addressed by industry, namely the establishment of a coordinated national breeding program and a national evaluation centre. Though still unresolved, the remaining issues have been the subject of lengthy reports and discussions (BCG, 1995), with progress being achieved in some areas. This paper describes the concept and establishment of a national malting barley evaluation centre and discusses current and future roles of the centre.

Concept

Barley breeding centres are permanent features of crop improvement programs in Australia. Each program is overseen by a barley breeder(s) with the support of groups such as pathologists, agronomists and chemists. The latter comprises the staff together with the appropriate laboratory facilities for carrying out the assessment of malting quality attributes of lines grown within the program. Though similar, the methodologies used by individual laboratories do vary. While such methods are capable of identifying differences albeit improvements in quality attributes of new lines compared with the standard varieties, there is a need to standardise the analytical procedures at a later stage for comparative purposes. The

assessment process is further complicated within these laboratories by the use of different types and models of micromalter, as well as different micromalting protocols.

During the latter stages of each breeding program when promising lines(s) are being simultaneously evaluated, seed is supplied from regional trial plots to commercial malting companies for assessment. Subsequently a full industry committee comprising brewers, maltsters and marketing organisations, as well as breeding and associated interests reviews the results. This acts as the forerunner to a decision to progress the lines(s) for pilot malting and brewing trials. Deficiencies seen (by Armitt) in this process were that although procedures used by the various breeding centres were suitable for identifying improved quality attributes in a new line, there was no common method in use to compare performance at a national level. Further there was no particular centre or organisation that coordinated the collection and presentation of data on an annual basis for comparing the performance of promising cultivars emerging from regional variety trials at a national level. Also there was no completely independent system by which to review and compare promising lines at a national level. Although this was one of the objectives of the Malting and Brewing Industry Barley Technical Committee (MBIBTC), the assessment and its outcomes were not entirely independent of commercial interests (Lazenby et al., 1994).

Establishment

Given the above background, the Australian Associated Breweries (AAB) undertook steps to support research, in a number of areas across Australia, aimed at developing malting barley varieties with improved quality attributes both for the local and overseas markets. In particular, there was strong backing for the establishment of a national evaluation laboratory, as it would be seen to have the following advantages:

- Selected material from all breeding centres would be evaluated by a standard technique.
- Performance of cultivars would be compared under identical conditions thereby providing a real comparison on a national basis.
- Management would be independent of individual programs and commercial implications.
- The centre would be geared to focus on relative comparisons and possible research at the important interface between breeding/selection and commercialisation.
- The centre would be seen as an extension of the national malting barley breeding program in that the work carried out was an extension of each of the regional breeding programs. At the same time, the centre would unify and directly compare results on a national level.

In 1993, the Barley Quality Laboratory of the Department of Primary Industries in Toowoomba was chosen by AAB as the site for the new facility to be known as the Australian Malting Barley Centre (AMBC). The selection was based upon the proximity of the laboratory to large breweries, the interaction of laboratory personnel with all sectors of industry, and the desire to spread the AAB support across all barley producing areas. Further, AMBC would be able to utilise the facilities and expertise of the QDPI laboratory, but would be required to operate independently of it. Location of the Centre within an existing quality laboratory would result in considerable savings over the development of a new 'stand alone' facility. To enable the Centre to perform its proposed functions efficiently and effectively, the laboratory was extensively upgraded through the provision of infrastructure grants from the Grains Research and Development Corporation (GRDC) and QDPI.

Other industry groups also expressed a desire to become associated with the formation of the Centre. These included maltsters, marketing authorities and the GRDC; the latter bringing a grower input into the Centre. Subsequently the involvement of all industry groups was formalised by a Participant's Agreement which covered legal and operational aspects of the Centre. All matters arising under the Agreement were to be managed by a 10-member Technical Management Committee (TMC) (including a Chairman) comprised of representatives from all industry sectors. A Senior Research Scientist would carry out the daily operations of the Centre, while overall management was the responsibility of a Centre Manager. Both positions are presently held by staff of QDPI.

The first meeting of the TMC, in early 1996, set out the objectives of the Centre. Though not listed in order of priority, these were to:

- (1) Assess the malting quality of promising lines emerging from regional elite trials using a standard micro-malting program.
- (2) Collate information on problems identified from pilot or commercial malting and brewing trials.
- (3) Identify possible research projects for GRDC and/or industry funding (to be carried out by research agencies, not necessarily by the AMBC).
- (4) Contribute to the standardisation of laboratory techniques, both nationally and internationally.
- (5) Collate and disseminate all available information on micro-malting, pilot malting and pilot brewing of potential varieties.
- (6) Provide malts for pilot brewing trials as required.
- (7) Act as a referral centre for access to expertise on Australian malting barley.
- (8) Carry out fee-for-service activities, if appropriate.
- (9) Undertake varietal identification as required.

Malting Quality of Elite Barley Lines

Currently the major function carried out by AMBC is to assess the malting quality of elite lines emerging from all state breeding programs. The majority of these lines are at different stages of industry evaluation (MBIBTC, 1998).

Each year breeders nominate their most promising lines for evaluation by AMBC. The TMC approves and priorities the nominations, including check varieties, which are the major variety(s) grown in the region. Detailed grain quality analysis is carried out on the successful nominated samples and the data forwarded to breeders for final approval to proceed with malt quality assessment. Micromalting is carried out using a standard protocol which is similar to the one recommended by industry (MBIBTC, 1998). Thereafter the malts are assessed for quality using a series of large-scale procedures (EBC, 1998) and the data forwarded to the TMC for release.

The actual operations of AMBC commenced in 1998 following the appointment of a senior research scientist. Initially work was restricted to (i) commissioning of new equipment (ii) achieving uniformity across the micromalter bed and (iii) familiarisation with malt quality methodologies. Thereafter, some 60 lines were assessed for malt quality and the data submitted to the TMC for dissemination to industry. More recently, the official opening of AMBC was performed by the Queensland Minister for Primary Industries, Mr H Palaszczuk MLA, thereby demonstrating the commitment of QDPI to AMBC and its objectives.

ISO Certification

One of the recommendations of the GRDC review of the QDPI Barley Quality Laboratory in 1995 was that the laboratory should seek to gain some form of accreditation or certification for its operations. With the establishment of AMBC and its projected use of this laboratory, the requirement for certification was heightened. In late 1998, a decision was made to seek ISO 9001 certification for both the Barley Quality Laboratory and AMBC under the one umbrella. To date, a preliminary audit has been successfully undertaken with certification expected to be achieved by early 2000.

Control Grain and Malt

A recent undertaking by AMBC is the supply of grain and malt for use as controls by the five Australian barley quality laboratories providing support to state barley breeding programs. At present, these controls represent the only check samples common to all laboratories. With the GRDC funded move to standardise methodologies used in these laboratories, the controls will provide an independent benchmark of each laboratory's analytical performance.

Pilot Malting

AMBC possesses micromalting facilities capable of producing batches of 10-12 Kg of malt from lines destined for pilot brewing trials. Industry studies are in progress seeking suitable replacement fumigants for insect control during grain storage (Wright, 1999). Currently AMBC is producing malts for the pilot brewing trials associated with these studies.

Future Roles

Any expansion of the current roles of AMBC will depend upon the support of industry in providing the additional resources needed to perform these roles. For example, once ISO certification is obtained, AMBC will be better placed to offer some fee-for-service activities to outside clients. However, any additional roles must not be allowed to detract from the present functions now being undertaken by AMBC.

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