

Role of the Malting and Brewing Industry Barley Technical Committee

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Introduction

The Malting and Brewing Industry Barley Technical Committee was formed in 1983 in response to a request from barley breeders for closer liaison with industry in defining the quality of malting barley. The committee is a sub-committee of the Australian Associated Brewers and the Australian Malt Exporters Committee. The objectives of the MBIBTC are:

1. To maintain the supply of high quality and high yielding barley varieties for the Australian malting, brewing and barley industries.
2. To assist in the development of, and participate in the evaluation of, potential malting barley varieties.
3. To classify new malting barley varieties throughout Australia as to their acceptability for malting and brewing purposes.
4. To inform growers, barley breeders and various organisations on the requirements of the malting and brewing industries.
5. To monitor and approve the use of new pesticides on malting quality barley during storage and handling.
6. To liaise with all sections of the Australian barley industry to advance these objectives.

To achieve most of these objectives the committee has produced and updated the “Industry Guidelines for Australian Malting Barley” with the most recent update released last year.

Malting Barley Evaluation System

In the last five years a number of new malting barley varieties have been released by breeders after successful evaluation by the MBIBTC system. The evaluation system put in place appears to be working quite well and as a committee we are finding good cooperation between brewers, maltsters, barley breeders and researchers, farmers, GRDC and the grain handling and marketing companies in getting varieties evaluated as soon as practical. The MBIBTC evaluation system as it exists now is shown in Table 1.

The changes made to the system since its introduction include attempting to link the MBIBTC evaluation with the seed multiplication stages so that when varieties successfully complete the evaluation stage sufficient seed is available for large scale planting. Stage 3 as an interim stage so that pilot brewing can be done at stage 3 if insufficient grain is available at stage 2. Also there is the option of accelerating the process by combining stage 3 and stage 4 into a single year if grain is available and there is a desire to accelerate the evaluation of a variety.

Table 1. MBIBTC Malting Barley Evaluation Protocols

Stage & Year	Barley Quantity	MBIBTC Testing
Stage 1	1 kg x 3 growing sites	Micromalting
Stage 2	1 kg x 3 growing sites 30 kg	Micromalting Pilot Brewing
Stage 3	1 kg x 3 growing sites 1 kg x 10 sites	Micromalting evaluation prior to bulking Micromalting
Stage 4	1 kg x 10 growing sites up to 250 tonnes bulked	Micromalting Commercial malting and Brewing
Stage 5	500 to 1000 tonnes bulkied	Commercial malting and Brewing

Barley Quality Ratings

Evaluation of the quality of new varieties by the MBIBTC quality ratings system has shown a pleasing improvement in the quality of the new varieties over existing varieties as shown in Table 2.

Table 2. MBIBTC Quality Ratings - 1999

VARIETY (Adjunct Type)	REGIONS					
	NORTHERN		SOUTHERN		WESTERN	
	Solid	Liquid	Solid	Liquid	Solid	Liquid
Franklin			8.0	7.0	7.3	6.8
Arapiles			6.0	7.5		
Picola			6.3	6.5		
Sloop			5.5	6.0		
Tallon	5.5	6.0				
Lindwall*	5.5	6.0				
Grimmett	4.8	6.3				
Gairdner					6.3	7.8
Stirling					4.0	5.5
Parwan			4.3	4.5		
Schooner			3.5	4.5		
Skiff			3.5	3.5		
Chebec			3.0	3.0		

* In final year of commercial trials.

As shown in the table virtually all new varieties rate at least 6 on the rating scale for liquid adjuncts with some of the better varieties now 7 or better. However compared to some of the overseas varieties particularly those that directly compete with Australian varieties there is still room for improvement particularly with extract where most of the major European and Canadian varieties are above 81% EBC.

At a previous RACI meeting issues about the rating system were raised in relation to the scoring system, where a small difference in some values may lead to a larger change in the rating. The rating is applied initially at stage 4 of the evaluation protocol and is based, weather permitting on an average of micro-malts from at least 16 samples from multiple sites

over 3 years hence a small difference in value is unlikely to be a one off result. In addition the newer varieties are showing up as clearly better in the current system so the rating system appears to be working. However in future the quality differences between varieties may become smaller as the values rise closer to 10 and it may be necessary to revisit the scoring system.

Barley Rating System

This scoring and category system was changed from the previous system of just four categories, extract, diastase, index and viscosity, to 6 categories with fermentability (AAL) and β -glucan added. One of the main reasons was the divergence in beer styles between Australia, with its low and mid strength beers, and overseas, particularly Japan with the emergence of the dry beer style.

In Australia low and mid strength beers are made using high temperature mashing technology. This technology restricts the breakdown of starch during mashing to result in beers with higher than normal carbohydrate content, which overcomes some of the taste changes caused by the lack of alcohol. This means that varieties suitable for Australia do not require high levels of diastase enzymes or high fermentability. In addition most Australian breweries use adjuncts of either sugar or hydrolysed wheat syrups, which don't require malt enzymes to produce fermentable carbohydrates.

In contrast, Dry beers require high levels of diastase enzymes and high fermentability to break down the starch to cut down on residual taste. As well the expanding beer market in the world has recently been in Asia, particularly China, and these markets rely heavily on rice as an adjunct source. Rice or other solid adjuncts rely on malt enzymes to complete the breakdown of adjunct starch, so high diastase and fermentability are an advantage.

Hence the rating system is now split into a liquid adjunct rating and a solid adjunct rating with different scales applied to the diastase and fermentability which has also been introduced into the rating system. It also means that in future some varieties may be more suitable for export than the domestic market and vice versa. The β -glucan rating score as well as viscosity was introduced to reflect the impact β -glucan has on beer filtration, particularly sterile filtration.

MBIBTC Evaluation and Commercial Success.

One issue that has arisen is the MBIBTC evaluation process and subsequent commercial use by overseas and domestic brewers and maltsters. The MBIBTC process establishes whether a variety is suitable for malting, that is, acceptable beer can be made from the variety. It does not guarantee that the variety will be a commercial success. Any new variety must offer some benefit either agronomically (stability of supply) or on quality grounds over existing varieties so that the end users such as brewers or maltsters have an incentive to change.

Also any variety released as a malting variety in a region is regarded as malting Australia wide but will be separately rated based on micro-malting data only when grown in other regions. This is to establish quickly whether a variety gains malting quality in the new growing region. Again these malting varieties must compete against existing varieties in a particular region to gain commercial acceptability.

The AMBC & Future Directions in Breeding Programmes

The AMBC is now up and running and will soon begin evaluation of a number of breeders elite lines. The MBIBTC sees the AMBC providing a valuable role in being able to assess all the emerging new varieties from the breeding programs under set micro-malting conditions. This will allow the MBIBTC in consultation with the breeders to select the best varieties to bring through the MBIBTC evaluation system and enable gaps in the quality of current varieties to be filled. The aim is to ensure that a pool of varieties is available to satisfy both domestic and export needs.

As indicated previously when comparing current Australian varieties with those overseas there is a need to increase the extract of the Australian varieties even if this means a decrease in diastase. This is particularly needed in the low rainfall areas of the Southern region as it appears that Sloop whilst having some improved quality characteristics does not have an extract advantage over Schooner. The lack of good and consistent growing seasons in the Queensland part of the Northern Region which has suffered poor growing seasons in several of the past 7 years, may mean that new varieties need to be targeted at a wider range of optimal planting dates. This would increase diversity and hence probability of production of malting quality barley in some regions.

The frequency of release of new varieties may also become an issue. In the past the life cycle of varieties has probably been too long, however with the evaluation system now up and running, and a focus on getting new varieties assessed and released, there could be a tendency to replace varieties too quickly. Replacing varieties unless for agronomic (disease problems, poor yields) or clear commercial reasons, (such as no commercial demand), under 5 years will not allow sections of the industry time to adapt to new varieties and could be counter productive, particularly in export markets.

Changes in Grain Handling & Marketing.

The privatisation and deregulation in the grain handling and statutory marketing authorities has opened up the opportunity for improved efficiency in grain handling, storage and marketing. The key from an industry perspective is the cost versus the benefit of any arrangements. More on-farm storage and direct purchases from farmers may be a future direction but the quality control, food safety and storage conditions for grain on farm become critical factors. To that end the MBIBTC is supporting the On-farm Quality Assurance System for grain growers.

Research & Development

The introduction of the GRDC has had a number of benefits in particular in a more commercial focus to research whilst still allowing a wide variety of research opportunities. The MBIBTC is endeavouring to put together a list of what it sees as research and development opportunities that would have potential benefits for the whole industry and is more than willing to share this with any interested parties.

Communications & Reporting

As a committee the MBIBTC is looking at ways in which it can report back to the industry in the most efficient manner to get to the widest audience. We have used the Barley Technical

Symposium, Ground Cover articles and mail outs as a means of getting our message out but would appreciate some feed back on whether these are the best ways. There is an issue on the publishing of an annual update on approved varieties, trialing of new varieties and current rating of varieties in terms of the best forum and timing, as often complete information on the Brewing Trials may not be available until January each year.

The MBIBTC is also asked to be represented on many committees and whilst we as a committee try to provide representatives to many committees, this is only possible with the co-operation of our employers. Hence it is not possible for MBIBTC members to accept every request made and that as a committee our preference is to attend those committees which directly impact on our objectives.

Conclusions

The MBIBTC performs an important role in providing an industry perspective to many aspects of the malting barley industry. The malting barley evaluation system seems to be working well and the overall quality of Australian malting barley is improving. Key issues that are emerging are the number of malting varieties and the potential for domestic and export malting varieties and the frequency of release of new malting varieties. Deregulation in grain handling and marketing offers new opportunities but only if the cost and benefits are favourable. The committee is also endeavouring to be more pro-active in R&D and communication of its message to the industry.