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## **Malting and Brewing Industry Barley Technical Committee - Future Directions**

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# **Introduction**

The MBIBTC was formed in 1983. At that time, three new varieties that have become the core of Australia's production were being introduced - Grimmatt, Schooner and Stirling. These varieties were accepted through various evaluation processes informally organised between regional breeders, maltsters and brewers. It was apparent to breeders that there was a need for a representative maltster/brewer body that could provide breeders with clearer signals of end user requirements for new lines.

Accordingly breeders approached the industry and the MBIBTC was formed at the Inaugural Barley Technical Symposium in Perth. The new organisation was endorsed by the Australian Associated Brewers, the Australian Malting Industry, the Institute of Brewing (Aus & NZ) and Australian Malting Barley Improvement Council. Initial committee concerns as described by Way (1985) were:

- decline of malting barley at the expense of feed barley
- end user representation in barley improvement programs
- Australia wide industry cooperation in accreditation and release of new malting varieties
- use of agricultural chemicals and potential chemical residues in malting barley.

These were addressed through the following objectives:

- to maintain the supply of high quality, high yielding malting barley for the Australian barley, malting and brewing industries
- assist in the development and evaluation of potential new varieties
- classification of new varieties for acceptability for malting and brewing
- seed cooperation from all sections of the barley industry to advance these objectives.

# Evolution

In the intervening period the committee has addressed these issues which continue to occupy the committee. However significant changes have occurred over the past 18 years involving; farm practices, climate, statutory regulation of grain handling and marketing, malting companies, brewing companies and research structure and funding.

The combination of seasonal and farm practice factors has resulted in a shift in the distribution of Australian barley production as shown in Table 1.

**Table 1. Australian Barley Production - 1980 - 2000 (x1000 tonnes)**

	Qld	NSW	Vic	Tas	SA	WA
1980 - 1989	420	680	484	24	1386	746
1990 - 1999	239	1003	1038	31	1787	1228

During the 1990's deregulation of barley handling and marketing commenced and continues. There is also an ongoing trend towards increased on farm storage capacity.

Malting and brewing companies have consolidated significantly and new malting companies have emerged.

Up until the early 1990's support for barley improvement was directed through the state/regional programs. With the establishment of the GRDC (established 1990) has come a major shift in the funding and direction of barley research. In particular it has increased the commercial focus of research and has promoted the regional and national integration of the breeding programs.

The MBIBTC has developed in parallel with these changes. The core activity of assessment and accreditation of new varieties was formalized through the MBIBTC Protocol (1998) that specified barley quality, micro-malting, pilot brewing and quality assessment criteria. In addition commercial trials, a protocol for assessment of new grain protectants and recommendations for storage of malting barley were developed.

MBIBTC's role in defining end user priorities for barley research and development increased after the GRDC was formed. Both as individual members and as a committee, MBIBTC was increasingly involved in project reviews and planning of the future of the malting barley industry. This includes members involvement in the Barley Quality Objectives Group and continued commitment to the malting Barley Development Council.

## Current Status

The formal structure and constitution of the MBIBTC has changed little since its inception in 1983 and is reflected in the current composition of the committee. The committee is a sub-committee of the Australian Associated Brewers - Technical Committee and the Australian Malt Exporters Committee. The objectives 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.

Objectives 1-3,6 are little different to the originals while 4 - 5 reflect the evolving role of the MBIBTC.

The current issues confronting the MBIBTC fall into three areas:

- Barley Improvement
- Assessment and accreditation of new lines
- Delivered barley quality

## Barley Improvement

Focus in malting barley improvement has broadened across the supply chain from agronomic improvement with assessment for possible malting acceptability (Clipper), through agronomic and malting quality (Grimmett, Schooner, Stirling) to actively breeding for desirable agronomic, malting and brewing characteristics.

Committee support for the current programs is through evaluation, comment and assessment on advanced lines, involvement in industry forums defining breeding targets, feedback on specific project proposals on end-user relevance and priority, and collaboration in projects investigating factors impacting on malt and brewing quality.

### Assessment and accreditation of new lines

The MBIBTC protocol provides for assessment by micro-malting and analyses on advanced lines provided by the various programs. This allows early feedback and discussion regarding likely commercial performance and provides malting data for commercial trials. The stages of the evaluation protocol have been reviewed regularly in an attempt to fast track evaluation and coordinate assessment with seed multiplication stages. Most recently the requirement for mandatory pilot brewing has been dropped with the potential for eliminating one year if sufficient seed is available.

Quality assessment ratings were updated in recent years to provide a more meaningful measure of malting/brewing quality by taking into account the impact of the market requirements, specifically the impact of brewing adjunct type on desired enzyme levels. The current ranking of Australian varieties is summarised in Table 2 according to suitability for use with solid (starch) and liquid (sucrose, maltose syrups) adjuncts. This distinction corresponds to the requirements of export and domestic markets respectively.

**Table 2. MBIBTC Quality Ratings - 2001**

	REGIONS					
VARIETY	NORTHERN		SOUTHERN		WESTERN	
<i>(Adjunct Type)</i>	<i>Solid</i>	<i>Liquid</i>	<i>Solid</i>	<i>Liquid</i>	<i>Solid</i>	<i>Liquid</i>
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*			7.0	7.3	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		

\* Commercial evaluation still required for Northern region.

## **Delivered Barley Quality**

The supply of varietally pure, viable and residue free barley is essential for production of quality malt. However the handling and marketing of malting barley has tended to play a secondary role to the above areas of MBIBTC activity. Storage interest has centred on approval of grain protectants and a strong preference for the use of inert atmospheres or fumigants rather than contact grain protectants for barley storage. At various times the committee has provided input on barley receival standards with respect of variety, moisture and colour.

# Challenges of the Future.

The primary objective of the MBIBTC remains the supply of high quality malting barley to the Australian malting and brewing industry.

**Table 3. Malting Barley Supply Issues**

1. Climate	Projected declining winter/spring rainfall for grain regions
2. Segregation/ aggregation	Consistent receival standards, increased pressure from other crops, too many varieties, active stack management
3. No. of varieties	More difficult to maintain consistent malt quality/brewing performance
4. Quality Assurance	Food Safety Plan (product traceability) and chemical residue limits both domestic and export (country specific).

Factors 1-3 impact directly on the consistency of the malting barley received. The number of varieties and/or the number of regions involved increase the variability between parcels of barley. Similarly consolidation of depots because of poor seasons or for bulk shipment reduces the homogeneity of the grain within individual parcels. Both introduce increased and in some cases unacceptable levels of variability into processing and product quality. Of particular concern to the malting and brewing industry is the consolidation of wide protein bands which degrades malt quality and impacts negatively on the brewing process, e.g. colour control, filtration.

MBIBTC has previously expressed strong support for quality assurance starting on farm. Whether supply is from barley marketers or direct from on-farm storage, the quality control, food safety and storage conditions for grain from the farm onwards are critical factors in ensuring barley acceptability.

**Table 4. MBIBTC Research and Breeding Opportunities**

Breeding	Need for a dominant variety for the eastern states  Breeding to achieve both high extract and moderate (domestic) or high (export) DP
Storage	Effect of barley storage conditions on grain dormancy and germinability  Rapid silo based variety tests
Malting	Independent control of protein and starch/carbohydrate/glucan modification during germination  Population distribution based quality tests for barley and malt homogeneity
Brewing	Properties of diastase enzyme during mashing  Effect of starch granules and their size on malting and brewing  Role of polyphenols in beer flavour stability  Validity of current malt parameters in relation to brewing performance

In addition to the items listed the MBIBTC is vitally interested in the evolving changes to the Barley Improvement program instituted by the GRDC.

## The Future

MBIBTC is the national representative organisation of the malting and brewing industries in Australia. Its role has broadened from the original breeder liaison/accreditation role. The committee has become an effective pre-competitive forum where issues, ideas and strategies concerning the industry may be canvassed. It is also a vehicle to express and interface on behalf of its members with other stakeholders in the barley beer chain.

Accordingly the following changes to the MBIBTC constitution are proposed:

- establish the MBIBTC as an independent committee, free of the formal links to the AAB and AMEC
- open membership to other Australian malting and brewing companies
- widen membership to ensure a national focus and full industry representation.

While the brewing industry is well represented there is a significant tonnage of malt produced by companies that do not have representation. Also if the committee is to function effectively as a national body it is important that all regions are represented to provide a local linkage into the barley industry of that region.

The committee objectives are also being reviewed. In current form, these are:

1. To assist in the development of, and participate in the evaluation of, potential malting barley varieties for domestic and export malt for use by member companies.
2. To accredit new malting barley varieties throughout Australia as to their suitability for malting and brewing purposes of member companies.
3. To inform growers, barley breeders and various organisations on the requirements of the malting and brewing industries.
4. To approve the use of chemicals on malting barley during storage and handling for member companies.
5. To liaise with all sections of the Australian barley industry to advance these objectives.
6. To provide R & D agencies with information and industry knowledge to assist in the allocation of research funding.
7. To review R & D proposals as requested.
8. To act as a combined industry body to advance the interests of the member companies to ensure supply of high quality malting barley.

The changes to the MBIBTC have been evolutionary and this is expected to continue. The emphasis of the committee during this process of review has been:

- to broaden its representation of the domestic malting and brewing industry,
- to increase its recognition as the representative body of the barley industries domestic customers
- to recognise and publicise differences in members market requirements, e.g. domestic vs export malt.
- to increase its involvement in barley supply issues, particularly storage and handling

## References

1. Climate Change Projections for Australia (2001), CSIRO Climate Impact Group, (<http://www.dar.csiro.au/publications/projections2001.pdf>)
  2. Industry Guidelines for Australian Malting Barley, Volume IV (1998).
  3. Way, H., (1985) Aust. Barley Technical Symposium, Toowoomba; 35-37.
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