

## DEVELOPING QUALITY WHEAT VARIETIES FOR THE MARKET

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*Summary.* Wheat varieties with enhanced quality are of vital importance for the future of Australia's wheat industry. Varieties that are tailored to meet the requirements of the marketplace are very likely to contribute to greater returns received by wheat growers and to an increased value for Australia's wheat industry. These new varieties need to be developed by taking into account the exact needs of discriminating buyers. Of particular importance is the requirement of the Asian marketplace which currently imports approximately 40% of Australia's wheat crop and is predicted to become a market region of increasing importance.

### INTRODUCTION

The gross value of Australia's wheat industry is close to three billion dollars a year making it an integral part of the Australian economy (1). The development of wheat varieties with improved processing quality is of major benefit to the industry because of the resultant enhanced marketability of this wheat. These benefits are likely to be translated into greater returns to the grower and the Australian wheat industry through enhanced value of the wheat for the domestic end-user and a greater share of the premium export wheat markets.

Wheat varieties with improved quality will better satisfy the requirements of the domestic and export markets. In the past, new premium grade varieties have achieved a high rate of adoption by growers and there is every indication that this practice will continue. In addition, the domestic market and the Australian Wheat Board will continue to encourage, by offering greater financial returns, the production of varieties with improved quality.

### WHEAT PRODUCTION AND UTILISATION IN NORTHERN AUSTRALIA

In the 10-year period (1984-85 to 1993-94) the average annual production of wheat in Australia has been 14.783 million tonnes (2). However, in this paper, the major focus of attention will be on the development and production of varieties for the northern grains region which encompasses Northern New South Wales and Queensland. In this region, the average annual production of wheat for the same 10-year period (1984-85 to 1993-94) has been 2.578 million tonnes while the equivalent average annual production in Queensland has been 1.154 million tonnes (3).

Australia continues to export a large proportion of its wheat production and in recent years this proportion has amounted to 80 to 90% of the total production. Compared with other major exporters, Australia has the highest ratio of wheat exports to production (5). However of these export destinations, the growing Asian markets appear to be much more quality conscious than those of the Middle East (1). From an export market viewpoint with a focus on Asia it has been estimated that on average, 50% of the wheat produced in the northern region in a given year would be exported to Asia whereas approximately 70% of the production in Queensland would be used in this market. In the case of the domestic market, it has been estimated that for this region there is an annual requirement of approximately 750,000 tonnes for human consumption with the Queensland component being approximately 250,000 tonnes.

### USES OF AUSTRALIAN WHEAT

Within Australia the main use of wheat continues to be for human consumption. Bread bakers use about half of the domestic flour production with the other major end-user being starch/gluten manufacturers who use approximately a quarter of the flour produced in Australia (5).

Australia's major export markets for the 5 years to 1991/92 have been the Middle East 48.7%, People's Republic of China 9.7%, South East Asia 15.7%, North Asia 15.9% and the Commonwealth of Independent States (former USSR), 2.3%, with the other areas 7.7%. In these markets, the wheat is used for a diversity of end uses. The major product of the Middle Eastern markets is the range of Arabic flat breads. Wheat exports to the east Asian region averaged 42% of Australia's total wheat exports in the five-year period to 1991/92. Major Australian wheat importers in this region, including the quantity imported in million tonnes (5 year average to 1991/92) were China 1.050, Japan 1.029, Indonesia 0.851, Malaysia 0.486 and the Republic of Korea 0.463 (5). In these markets Australian wheat is used to make the various types of noodles, dumplings, steamed bread, pan bread and soft wheat products such as cakes and biscuits. Australia, unlike other major wheat exporters, produces exclusively white grained wheat. This feature, together with Australia's wheat quality control methods, has enabled it to earn an excellent reputation in the international market for its clean, dry and white-grained wheat.

## VARIETAL DEVELOPMENT

New wheat varieties with improved quality continue to be developed so that their intrinsic quality characteristics will provide benefits for the milling and processing industries both within the domestic and export markets.

A recent detailed study by the Grains Research and Development Corporation (GRDC) sponsored Wheat Quality Objectives Group documented the quality requirements of 22 wheat products or product classes. While it could be considered a daunting task by many wheat breeders if breeding guidelines for each of these product classes were introduced, it is important to note that many of the product classes identified have in common, a range of broad quality requirements. For example, the common requirements in wheat for most of these product classes are hard grain, high milling quality, medium dough strength and high extensibility.

Consequently, breeding programs in the northern region are very pro-active in ensuring that the quality of new varieties fits within these broad requirements. These goals are addressed in two main ways, firstly by extensive *in-house* evaluation of breeding lines from the programs and secondly by assessment of advanced breeding lines by the domestic flour milling industry and for an export market opinion, by the Australian Wheat Board's laboratory at the Academy of Grain Technology and in some cases by customer laboratories in South-East Asia and Japan. In addition, a number of new initiatives have and are being addressed with the objective of creating new marketing opportunities for Australian farmers by ensuring wheat varieties are bred to suit the market's needs. Examples of these are:

- Efforts by breeding programs in developing varieties with quality traits that satisfy particular industry needs, such as the work being undertaken to release improved varieties for the domestic baking industry which have good quality combined with short dough mixing requirements. Another example is the work being undertaken to ensure that new premium grade varieties destined for the Asian market have a high standard in the development and stability of noodle colour.
- The work of the GRDC Wheat Quality Objectives Group under the leadership of Mr R. Cracknell, Australian Wheat Board as chairman and Mr G. Crosbie, W.A. Department of Agriculture as convenor in reviewing the quality requirements of Australia's leading wheat customers. This group identified desirable end-products in each major market as well as quality requirements for these end-products. In addition, recommended quality objectives for wheat breeding were formulated as well as proposals for future research.
- The publication by GRDC of research priorities under the topic of *Developing Products for Markets*. This particular research objective is receiving a high level of support from GRDC with it's current investment being \$18.94 million, or 32% of the GRDC's 1995-96 total expenditure budget (4). Within this broad objective, GRDC has listed wheat processing quality as one of the major programs where an extensive list of research priorities has been formulated under the sub-headings of (i) noodles, (ii) bread and (iii) biscuits, industrial, pasta and generic quality. The topic of this paper relates very closely to the aim of this program, as it's aim is: *To continue to meet customer requirements and out-perform our competitors in*

*the international market place by: (i) Tailoring wheats to the changing and increasingly precise needs of discriminating buyers and (ii) Ensuring continuity and uniformity of supply of these wheats.*

The Asian region, with its strong growth potential in wheat consumption, has become the focus of marketing efforts by the major exporting nations. Consequently, the Australian Wheat Board has recognised the Asian region as an important and long-term market for Australian wheat which, because of its inherent quality characteristics, is well suited to the manufacture of various types of noodles and steamed bread. Australia, unlike other major wheat exporters, produces exclusively white grained wheat. However, currently breeding programs in countries that are major competitors of Australia, namely USA and Canada, are focusing increasing attention on developing premium grade white wheats in direct competition with Australian wheat. Therefore, it is extremely important that work be continually directed at developing new varieties with improved quality that are well suited to the requirements of the market.

The development of quality wheat varieties for sale to domestic and export end-users is of vital and increasing importance in the marketing of Australian wheat. The reason is that the resultant enhanced marketability of this wheat is likely to be expressed in greater returns to the grower and the Australian wheat industry.

#### ACKNOWLEDGMENTS

The project entitled *Wheat Quality Evaluation* which provides the wheat quality support to the QWRI component of the Northern Wheat Improvement Program is funded by the Grains Research and Development Corporation. The invaluable assistance of Bruce Stewart, Lisa Stewart-Gwynne and Kerri Rogers is also acknowledged.

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