Research and the restructuring of Australian agriculture: transforming comparative advantage into a competitive advantage

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Abstract

This paper sets out what has become obvious to most of rural Australia, that our longer term agricultural outlook is not encouraging and things have to change. The changes suggested refer to ways in which we organise and manage our rural industries so as to develop a much stronger processing capacity which will help to convert the comparative advantage associated with many of our food and fibre commodities into a competitive advantage for their products in export markets. This transition to a more balanced and profitable agricultural sector is discussed, along with the need for a new research approach and focus. This involves a greater emphasis on post production research problems through closer collaboration with the new industry sector to enable high quality food and fibre products to capture a share of the growing markets among the more affluent consumers in Asia and other parts of the developing world.

Introduction

If Colin Donald were here today he would be quite at home in a discussion of competitive advantage, as this was an area of his research on crops and pastures for which he received international recognition. He would also be pleased to see that many of the hypotheses he explored working here in Adelaide at the Waite are now part of our research approach, including the concept of plant architecture or ideotype as he called it.

I am delighted and honoured to be a recipient of the Colin Donald Medal. I knew Colin quite well and was familiar with his work. He was a very talented agronomist and did a great deal for the profession in Australia.

Agricultural outlook

The recent history of Australia's rural sector can be summed up in Fig. I, in which farm productivity over the last 20 years is plotted over the terms of trade for the same period. The impressive productivity gains achieved during this period have been completely offset by the declining terms of trade as a result of costs rising faster than prices received for farm products - the now familiar cost price squeeze. As a result, the last decade has been a very difficult time for rural producers in Australia. I won't go into the litany of other problems that have helped to exacerbate this situation, including droughts. high interest rates, the "fall out" of the EC and USA farm subsidisation program, and the self inflicted wounds resulting from the interventionist policies of the statutory market boards and corporations.

Unfortunately while we rely largely on bulk agricultural commodities for our export income, the rate of recovery in the medium term will depend on the pace of world economic growth and the progress towards trade liberalisation such as the EC is proposing for grains and beef. One positive trend is the growth of processed agricultural exports, which have more than doubled from a small base over the last decade.

Figure I: Australian farm sector terms of trade and productivity.

This process of value adding, especially for food products, is one of the directions Australian agriculture has to take in the future. The past is not a prologue to the future. Farmers are part of the consumer food and fibre sector and must see themselves as such.

In this paper I have attempted to sketch out some of the directions that agriculture will have to take in the decades ahead to capture the opportunities that exist for Australian food exports. 1 have also suggested some of the research that will be needed to turn our comparative advantage into a competitive advantage to capture a share of overseas markets, especially those associated with the more affluent sector of the booming Asian economy.

Our comparative advantage

The term comparative advantage as applied to Australian agriculture implies that we have an advantage in terms of the nature, scale or efficiency of our agricultural production, processing or distribution, by comparison with other producers in or out of the region.

Some of the factors that contribute to this comparative advantage include:

- efficient production of food and fibre from large scale, low input, mechanised agricultural systems. which because of our small consumption, has the potential to produce relatively high exportable surpluses
- adequate land and irrigation potential to expand the potential for more intensive, high value production
- a wide range of climates which provide the opportunity for the production and export of out of season temperate and tropical crops and their value added products
- Australia's reputation as a "clean country" free from industrial and other forms of pollution an advanced scientific and technological research base servicing the agricultural community
- proximity to the rapidly developing market economies of Asia and the growing demands for agricultural imports.

To realise the potential of these advantages, the nature, objectives and priorities of Australian agriculture must change, along with the research and development that will be essential to assist with this transition.

The changes needed to improve the range and competitiveness of our food and fibre exports

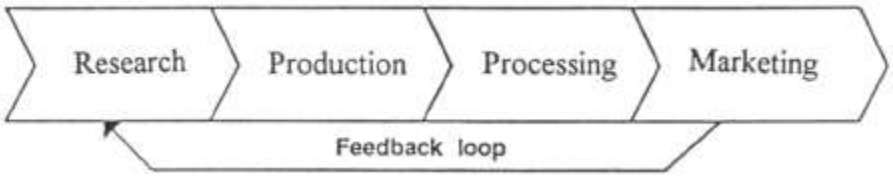
Restructuring our agricultural industries

The time is overdue for Australian agriculture to move away from its strong production focus and tradition of exporting bulk food and fibre commodities and to put much greater emphasis on value adding and product diversification for both the domestic and export markets. Although the export value of processed

food exports has been increasing at an average rate of 5% per annum in recent years, the total exports of such products in 1991-92 amounted to only 12% of the value of total rural exports (1).

To achieve these changes, there must be a fundamental restructuring of the agricultural sector, based on a new strategy and business plan, involving a clear focus on our major export markets, including special niche markets, especially those involving the more affluent sectors of the Asian community. This component of the Asian market has been growing rapidly and by the year 2000 is predicted to exceed 230 million consumers. The focus must be industry and customer driven and be capable of assisting the country become more globally competitive by exploiting our comparative advantage. Other requirements for this transition will be the vertical integration of the research, production, processing and marketing of commodities, active support from government to remove transport and marketing constraints, the provision of export incentives and assistance in gaining access to overseas markets (Figure 2).

Figure 2: Vertical integration required for agriculture (from McKinsey and Company)



This transition to a new paradigm for the future development of Australian agriculture calls for greater flexibility and adaptability in the agricultural community, and especially in the professional and management ranks. It will also require a major change in the research focus from one which has been largely production oriented, to one which is better balanced between production and processing with a greater commitment to social and economic factors and the development of market intelligence to guide the national export drive into new markets and products. For example, growth in the large Asian food market over the next 7-8 years is predicted to increase by $160 billion which presents an enormous opportunity compared with an equivalent growth of $6 billion in the comparable Australian market (3).

To achieve the growth and economies of scale needed to access these export markets, the larger food processing firms in Australia, such as Amotts, must develop effective strategies based on a limited number of priority consumer segments where they have a comparative advantage. Also in some cases, it may be necessary to form strategic alliances with Asian partners to acquire additional capital and "insider" access to Asian distribution and marketing skills.

Restructuring agricultural research

The success of agricultural research in the past has been largely related to the adaptation of crops and animals to Australian environments and the understanding and removal of constraints affecting the productivity of our major agricultural commodities. This emphasis on production research, both in the public and private sector, must change to allow a greater investment in research post farm gate and especially to support value added food and fibre industries.

As the total "research cake" has remained relative constant, the resources needed to strengthen the food and fibre processing industries must come from a reallocation of existing resources. The expansion in the amount and coverage of the matched industry levy funds for R and D (current value $167 million) has gone some way towards redressing this need. These funds however are based on the gross value of production which is prone to seasonal variation and which can reduce flexibility when encouraging the development of new industries, or in developing a new focus within an existing industry. For these reasons and the ample evidence for the high returns to investment in research, there is a strong case for increased funding for strategic and applied research by the public and especially the private sector.

Other changes that are necessary to improve the efficiency and relevance of agricultural research in Australia include the need for researchers to think more commercially and acquire a far greater

understanding of both domestic and international market requirements. These approaches, together with a long term national research strategy, are needed to assist in the transition of our agricultural sector to become more competitive and diversified with a much stronger agribusiness orientation.

Some of the factors that limit the effectiveness of research include the variability and uncertainty of research funding, which has led to an increase in short term research based on restricted funding; the fragmentation of rural research, and the lack of collaboration, which often leads to unproductive duplication. In 1989, there were 493 centres in Australia conducting rural research with an average staff of I I under the management of the States, university departments, CSIRO and the R and D corporations (2).

Despite this complexity there are indications that, through the influence of programs such as the Murray-Darling Basin, the CRC initiatives and the activities of ACIAR and the R and D corporations, contractual arrangements between complementary research groups and end users (industry) are increasing, resulting in larger more output oriented and better integrated collaborative projects, often spanning institutions and even state boundaries.

In addition to reshaping the agricultural and related research activities within Australia, our research must continue to maintain strong linkages with the international research community through research partnerships, visits in both directions and consultancies. Such activities lead to a better appreciation of market opportunities, new developments, including new genetic material and advanced technology and contacts which build awareness and confidence in Australia's ability to participate in the region's future trade opportunities.

Some important research goals for the future

Some research goals which will become even more important as Australia moves to add value to a greater range of agricultural products are set out below. These arc broad research objectives rather than priorities and apply both to the production and processing of agricultural products. They are derived from the successful research approach developed by the grape and wine industry which has been a model for a highly successful value added industry in Australia.

Production efficiency. This involves research to assist with the development of new knowledge, practices and technology that will help to further reduce the costs associated with the production and processing based on cost per unit of product. This greater efficiency reflected in a lower cost of production and higher return to capital will be a key factor in the ability of enterprises to compete on international markets. Some of the key areas of research which will contribute to further reduction in production costs include further mechanisation wherever possible, the better management of nutrients and water, and the more widespread use of IPM to reduce the use of costly pesticides and the possibility of residues occurring in the food products.

Product quality. Because of Australia's major focus in the past on the export of bulk undifferentiated commodities, the questions of quality and purity and market preference has not **been a major** factor in producing commodities for export. As Australia moves progressively into the production of differentiated products for special niche markets and processed foods and fibres, quality issues will assume much greater importance. These are based on a number of criteria including quality measures which may be objective or subjective, cultural preferences and quality assurance, relating to purity (absence of pesticide, herbicide and other residues) and freedom from harmful pests and pathogens.

The recent export success of the Australian wine industry is largely due to the rigorous adherence to these principles of efficiency and product quality. The high quality and consumer preference for the competitively priced Australian wine, linked to a voluntary inspection and assurance guarantee, has enabled producers in Australia to compete successfully in the highly competitive wine markets of Europe, North America and Japan.

Resource management for sustainable production. The rural producers in Australia are well aware of the need to reduce soil erosion. manage soil salinity and acidity and to protect our fragile resources from any further deterioration, but at the same time they are also aware of the need to increase productivity if their businesses are to remain viable. How to achieve both objectives will be a challenge for the researchers involved in resource management.

One of our key resources must be the irrigated agricultural land within the Murray Darling, Goulburn and Murrumbidgee rivers and the actual and potentially irrigable land in NSW, Queensland and WA. Virtually all this land is at risk from salt and if not carefully managed, the resulting soil salinity may reduce the already limited areas available to ensure the supply of high value crop and animal products which will be the basis of any agri-food enterprises of the future.

Socioeconomics. Much of the pre- and post-farm gate research in Australia in the past has had a strong biophysical bias and it is only recently that the key role of the socioeconomist in all aspects of the priority setting, aspects of design, benefit cost, adoption and impact has been fully appreciated. With the development of a strong agribusiness sector based on an aggressive export market, the role of the economist will increase in relation to customer preference, product specification, targeting market opportunities and assessing acceptance and impact. Australia is fortunately well placed to mobilise the considerable expertise that exists in socioeconomics in the country to support a drive to capture new export opportunities in Asian and other international food and fibre markets.

The nature of the research needed to achieve these objectives will vary according to the tasks in hand. It will be important that longer term basic and strategic research continues to be supported at an adequate level as it is the vital "feed stock" for the more applied problem solving research of the future.

Some features of the research approach in the future will be the need to adopt a more multidisciplinary approach, using biophysical and economic models within a systems approach to help solve many of the more complex, interactive problems. Molecular biology will also be used more widely to assist the plant and animal geneticists to develop crops and animals more tolerant of biotic and abiotic stresses and with the desired quality to give them a market advantage as fresh or processed products. Finally, research to complement the special requirements of the processing industries associated with an expanded agribusiness sector must receive greater support. We can no longer rely on research done overseas and for different products, as has been the case with many multinational companies operating in Australia. Industry and the public research sector must form closer partnerships so that local processors and their products have a competitive edge when trading in international markets.

Conclusions

This paper begins with the premise that "the past is not a prologue to the future" and that change in both the internal and external environments will influence the ways in which we manage our agricultural industries in the future. The dominant influence will be the growth in international markets, particularly in Asia. It is crucial that this country responds to this new opportunity by moving away from reliance on the export of largely undifferentiated agricultural food and fibre products, whose returns at the present time are at an all time low, and creates an agribusiness system based on customer needs, that has the scale and competitive advantage to capture a share of the lucrative overseas markets.

This change in our agricultural production focus to a more balanced approach, involving product differentiation to capture niche markets and further value adding of those commodities for which Australia has a competitive advantage, implies a major change in production and the development of extra industrial capacity. It also implies a change in the balance of broad acre versus the more intensive high value crops and in particular the research activities to support these.

Research will need to become more output oriented and market driven, while at the same time maintaining an adequate balance between strategic and applied approaches to provide the basis for ideas and new technology for the future. There will also be a need to achieve closer collaboration

between complementary components of the research community and to develop a better integration between the production and processing sectors of our agricultural industries.

"Facing a firing squad in the morning helps to sharpen the mind" and it is obvious that Australian agriculture has to develop a new game plan. The growing potential market among the several hundred million affluent consumers in Asia offers such an opportunity for those entrepreneurs who are prepared to form the necessary strategic alliances and to tailor our agricultural products to meet the market in this and other regions of the world.

References

ABARE, 1993. Agriculture and Resource Quarterly,5 (I),(ABARE, Canberra) 148pp

CSIRO,1992. CSIRO's Research for the Rural Industries. A Strategic Perspective. CSIRO. June 1992.

White, D. 1993. Agricultural Science . 6(2), 32-36.