The Victorian Dairy Industry - Improving Performance

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Abstract

The Victorian dairy industry has achieved significant growth and stability in the last decade. The industry has been benchmarked against dairy industries in other states and countries. This has indicated a continuing need to contain on-farm production costs to maintain the industries' competitive advantage(s). This paper considers key constraints to improving on-farm productivity; some of the approaches being undertaken to assist in adoption of known technologies for improving and measuring aspects of farm performance; and approaches being adopted to protect the natural resource base. While the Victorian dairy industry has dealt with many challenges, further advances and a continuation of restructuring will be needed to remain internationally competitive.

Key words

Victorian dairy industry, competitive, benchmarking, sustainability, productivity.

The profitability of milk production enterprises in the rainfed and irrigation areas in Victoria is under-pinned by efficient production and conversion of pasture into milk products. The competitive advantage of these production systems lies in low costs of production of milk. Despite this, milk production and milk harvesting account for over 60% of dairy industry costs, and small improvements can have a major impact on total industry profitability (2). Continued improvements in the amounts of pasture grown and used; in tactical use of brought in feeds to fill feed gaps; and in feeding cows with nutrients that are limiting the efficiency of conversion of pasture to milk will be required to maintain these competitive advantages.

The success of the Victorian dairy industry has been based on sustained growth, achieved through adoption of better management practices, structural adjustment and export competitiveness. The medium term outlook for the industry is good in terms of export volume growth, with expected gains from trade reforms and increased sales into Asian markets. However, prices at the farm gate may be flat or negative in real terms (7).

There is little doubt competition for markets will increase. The special product requirements of the Asian markets will need to be met, but it may not be possible to obtain premiums for commodity products, even if they meet the specifications of end-users (7). Current payment systems provide differential incentives for protein and fat content, and there are price reductions based on contamination (such as cell counts) and, in some instances, on volume. Clearly, there will be a continuing need for dairy farmers to profitably increase productivity. Advantages from economies of scale are likely to continue, with further decreases in farm numbers, while herd sizes will increase. At the same time, the industry will need to be "environmentally responsible", if it is to maintain market share and maintain (or increase) prices received.

The remainder of this paper considers:

- the position of the Victorian dairy industry relative to other countries and states,
- the on-farm changes which farmers, researchers and service providers will have to achieve,
- current benchmarking of performance at the farm level, and
- strategies to achieve continuing improvement.

Consideration is also given to the role of agronomists in this industry as it goes forward.

International benchmarking at farm level in the Australian dairy industry

The Dairy Research and Development Corporation (DRDC) and the Australian Dairy Industry Council (ADIC) commissioned a landmark study, "The Australian Dairy Industry International Benchmarking Project" in 1993, to further increase the international competitiveness of the Australian Dairy Industry (2).? The overall goal was to benchmark the performance of the industry against world best practice.

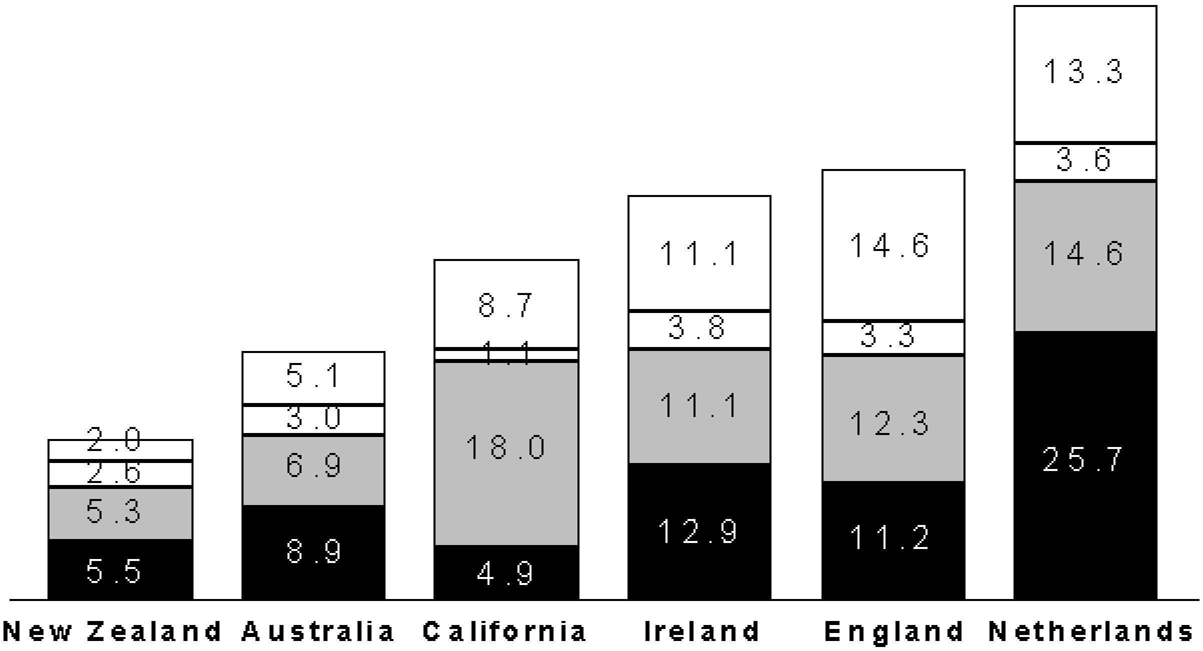
Farm costs were the largest component in overall industry costs. Measures of land and herd productivity, and rates of change in these, were found to be key benchmark variables. With the exceptions of New Zealand and Tasmania, Victoria has lower farm production costs than other states or countries (Fig. 1). Milk production in Victoria, like New Zealand, is largely seasonal, but farm costs are still 20 to 40 % higher in Victoria. The Boston Consulting Group (1993), who conducted this study, concluded the gap in domestic milk production costs between Australia and New Zealand could be reduced.

Victorian milk production has increased at 4.3%/year over the last 10 years and at 6.4%/year over the last 5 years (1) (Fig. 2) and accounts for 62% of national production. The increases in production have been achieved through increased production per cow, increased cow numbers and increased production per hectare. However, at the same time, there have also been increases in input costs, some of which reflect real increases in farm overheads, repairs and maintenance costs (2) (Fig. 3).

On the world scene, Australia and New Zealand together account for only 4% of total cow milk production, but Australia accounts for 11% and New Zealand 29% of manufactured milk products to international markets (1).

Seasonal milk production systems, while being a major contributor to low cost milk production, place Australian manufacturers at a disadvantage relative to competitors in non-seasonal regions or countries.In Victoria, the proportion of annual milk production in the "trough" quarter is about 12%, which compares favour-ably with seasonal production in Ireland (12% in "trough" quarter) and is higher than New Zealand (about 3% in "trough" quarter). This offers potential advant-ages in Victoria, compared to New Zealand, at the factory and manufacturing level.

Overseas competitors are achieving reductions in farm costs, with a trend back to grazing and away from intensive housing systems. Approaches in grassland systems and research, in other parts of the world, have adopted a production efficiency emphasis, taking into account soil and water degradation. This has been a fundamental change from the optimum/maximum production approaches used in the past. The Victorian industry must continue to emphasise production effici-ency, with gains possible through increased pasture utilisation, improved herd and nutrition management and continuing reduction in the number of small farms.



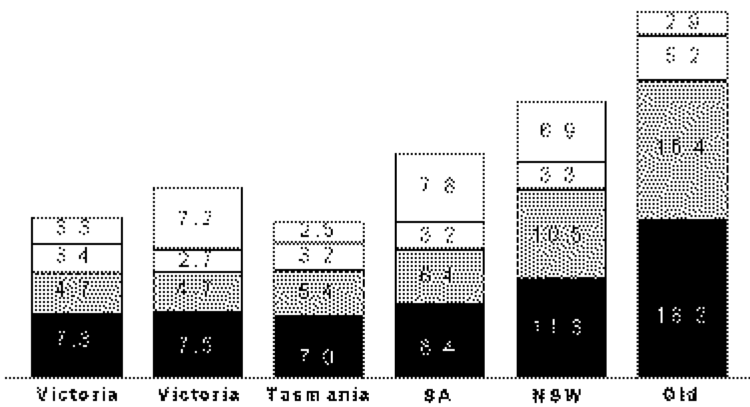


Figure 1

On-farm monitoring - financial performance

To continuously improve dairy farm businesses, as for other businesses, farmers must measure performance based on data. This is considerably more complex in farming businesses as managers must measure economic performance as well as the performance of complex biological systems. There is considerable vari- ability amongst dairy farm enterprises in the different regions in Victoria. For example, while the average herd size in the Northern Irrigation Region is about 140 cows, the range is from 30 to in excess of 1000 cows. Clearly, there is still a high proportion of small farms. The farming systems employed by dairy farmers, like herd size, vary enormously.

Benchmarking financial performance from year to year and against other farms is common when farmers use private consultants. No one measure will accurately depict performance, and it is common to use a basket of measures or indicators. Examples of measures used for financial performance are:

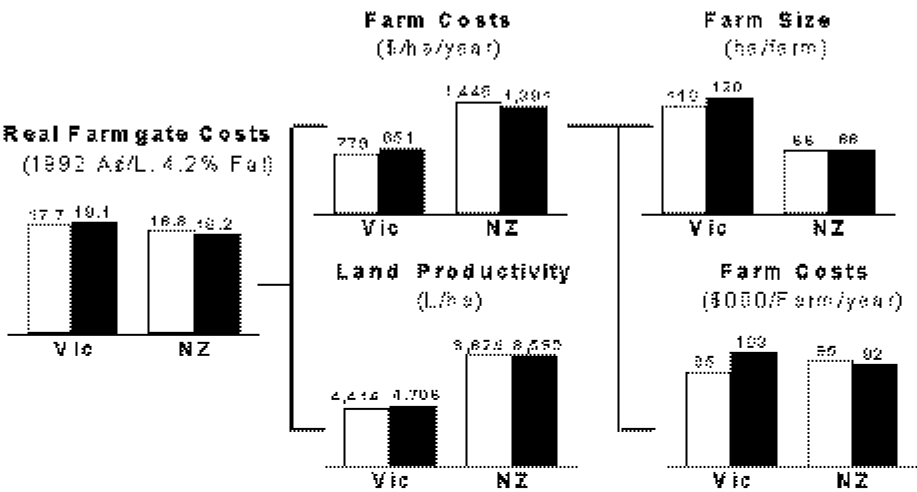


Figure 3

- cash operating surplus,
- economic farm surplus,
- return on capital,
- costs per unit of milk solids produced,
- costs per hectare,
- costs per ton of consumed pasture dry matter.

The use of such measures outside of consultancy groups is probably much less. One aim within Target 10, a partnership project between industry, the Department of Natural Resources and Environment, Victoria (DNRE), DRDC and service providers, is for 5% of Victorian dairy farmers to participate in Dairy Farm Performance Analysis. At present, there are about 80 (3% of total farms) farms in Gippsland, 50 (2%) in South Western Victoria, 60 (16%) in north eastern Victoria and 55 (2%) in the Northern Irrigation Region who participate on an annual basis.

A benchmarking study in western Victoria, indicated that the top and bottom 10 farms, categorised on profitability, did not differ significantly in terms of pasture utilisation, stocking rate and level of supplementary feeding (4). It was suggested that management skills, timing of activities and quality of inputs were critical factors in determining whether high input farming was profitable. The study found that large herds were more profitable and gave greater returns on capital than medium or small herds. Amongst the medium and small herd farms, profitability was achieved through getting more from each unit of resource input (especially land and labour).

In a study of expanding dairy farms, management style was found to be the main difference between farmers running high or medium-growth farms (3). Farmers in the high growth group were more likely to use plans with long term goals; consult within the farm team and seek external advice; have a strategic vision; be conservative and well considered; and be flexible and open to new ideas.

These studies indicate that the type of production system employed (*eg.* emphasis on pasture compared to high external feed inputs) and scale of operation are not overriding factors in determining business success.? Ability to manage the system, rather than the system itself, was the important determinant of business performance.

There is a trend for dairy farmers with large scale enterprises to adopt a managerial role, with skilled labour employed to run the day to day farming operations. However, the confidence of farmers and their preparedness to employ labour and change from a doing to a managing role are impediments to expansion of many dairy farm enterprises. Regional programs are implementing activities to improve and provide the skills needed in these areas. It has also been recognised in these programs that understanding the social fabric of farming communities and the implementation of sustainable learning systems are integral to a successful Victorian dairy industry (14).

It can be argued that dairy farmers need to more rapidly establish and use indicators for measuring farm financial performance. Regional approaches to industry development can be expected to accelerate adoption of measurement of performance. A recent assessment of the needs of the dairy industry in northern Victoria, has again highlighted the need for skills development in farm business management, including financial planning and investment, benchmarking, risk management personal development, labour management and quality management (8). The need and opportunities to change the focus in skill development from a training to a learning approach and to customise delivery of courses to suit various learning styles were emphasised.

Attention will now be given to key aspects of the biological systems that dairy farmers operate.

On-farm monitoring - production systems and challenges

Feed production

The climatic zones where dairying is practised in Victoria can be classified into temperate high rainfall, low summer rainfall and irrigation. In all zones, there is an underlying drive to increase pasture and fodder production to cope with the cost-price squeeze. This is evident when the energy available from rainfed pasture in "good" and "poor" growth years is compared to that required by cows for particular levels of milk production (Fig. 4). Clearly, at higher stocking rates, the energy gap increases, even in "good" pasture years. Variability also exists in growth of irrigated pastures between years.

From work undertaken in the 1970s and early 1980s, Stockdale (11) reported that irrigated perennial pastures produced between 14 and 20 t DM/ha/year. Subsequent work, at the Kyabram Dairy Centre (9, 10) and on farms in the Northern Irrigation Region (6, 13), has indicated pasture production is still within this range. While comparisons between these studies are not strictly valid, there are no directly comparable measures of pasture production over time in this or other dairy regions. The comparison indicates that, despite improvements in fertiliser and water use, recommendations of new pasture cultivars and improved grazing management, large increases in feed production are not evident. It may be argued that these technologies have contributed to maintaining pasture growth at optimal levels given the declining condition of the natural resource base in irrigat ion regions. Stockdale *et al.* (12) also raise the possibility that increases in stocking rates and reductions in post grazing pasture mass have led to constraints on pasture growth at critical times of the year.

There is also a lack of quantitative evidence that pasture production has increased in the rainfed zones.? Pasture growth or production are inherently difficult to measure, which makes benchmarking this key driver of farm efficiency inherently difficult at the paddock, let alone the farm, catchment or industry level.

Increasing the amount of feed grown on farm, without adverse impacts on the natural resource base, is a major challenge for research. It is likely that current systems will change substantially to strike an appropriate balance between profitability and ecological sustainability.

Some important constraints to increasing pasture production for each climatic zone are listed in Table 1. It is not possible to objectively rank the importance of these constraints; interestingly those listed would no doubt have appeared in any similar list compiled 20 years ago.? Soil-based constraints to pasture and fodder crop production represent major barriers to further improvements from current production systems. Considerable controversy exists about our ability to optimise the use of fertilisers and soil ameliorants, from both profitability and ecological sustainability standpoints. The industry has embraced a best management practice(s) approach to issues of nutrient and water use, with a real challenge to achieve more rapid adoption of recommended practices.

In general, the pasture and crop species used in Australia have been introduced. Many of the pasture species have come from Europe and New Zealand and they have been introduced to environments to which they may not be physiologically suited. Plant biotechnology research has blossomed over the past 10 years. These techniques are seen to offer potential benefits in increased production through adaptation to deal with climatic stress, through disease and pest resistance and through improvements in nutritive value. Despite the potential, truly effective on-farm benefits from transgenic pasture plants are some time off. Problems associated with their introduction into competitive ecosystems, in which they will have to survive, and with the need to define management regimes, which will enable them to persist in diverse pastures and with variable climate, should not be over looked.

Farmers often ask what is the ceiling to, or potential for, plant production in their environment. There will be no single answer to this question, but predictions of potential plant dry matter production would set goals to be strived for.

Water use efficiency as an example of on-farm bench- marking

In the irrigation areas, there is increasing emphasis on water use efficiency as the supply of irrigation water has been capped and there is continuing flux in policies relating to water transfer and water price.? In a study supported by DNRE, the Murray Darling Basin Commission and DRDC, benchmarks for water use efficiency for individual farms and the industry have been established. The data collated show a four fold range in net milk production per ML of irrigation or total water used (Table 2).

Most effective use of irrigation water was associated with:

- reduced amount of irrigation and rainfall run-off - through good management of irrigation and recycling of runoff from irrigation and rainfall,
- growing better pastures - through appropriate use of water and fertiliser, pasture renovation and weed control,
- increased consumption of pasture per hectare - through appropriate stocking rates, grazing between recommended boundaries and conservation,
- optimised use of supplements - through reduced substitution and understanding the economics of responses to supplements,
- increasing the proportion of energy consumed that was converted to milk - through appropriate per cow production and management of non milking stock.

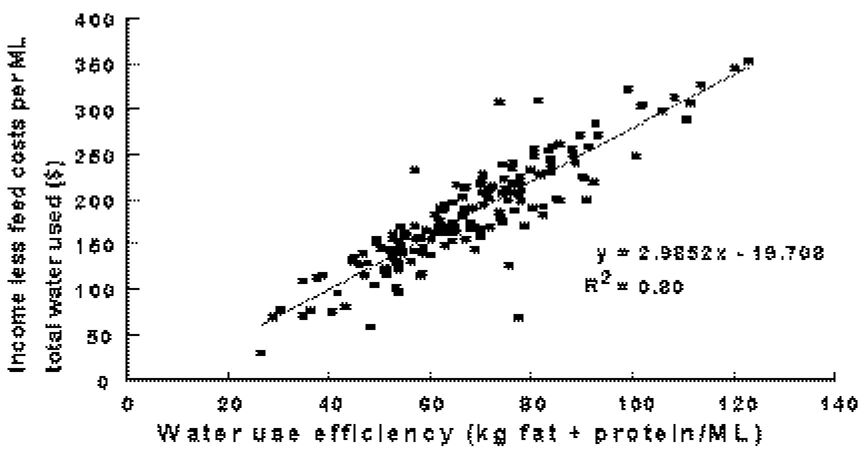


Figure 5

Interestingly, and as with the benchmarking study in western Victoria (4), there were farmers with high stocking rates and/or high supplement use in both the high and low efficiency groups. Likewise, there were farmers with low supplement use in the high efficiency group.

The financial performance for farmers surveyed was calculated as income net of feed costs from production and input details collected. Average prices for inputs and outputs were used to allow a comparison of different production systems independent of individual purchasing opportunities and sale prices for milk. A positive correlation occurred between water use efficiency and income net of feed cost per hectare, cow or megalitre of total water used (Fig. 5).

Feed utilisation

A major thrust of the Target 10 extension program has been development of grazing strategies to increase pasture utilisation (the proportion of the pasture grown that is consumed). While pasture utilisation is believed to be about 50% on an average dairy farm, reliable estimates are not available due to difficulties in measuring how much pasture is actually grown. Hence, extension programs for the dairy industry have adopted the use of the production efficiency analysis to calculate the amount of pasture consumed on farm. This involves estimating the amount of energy required for milk production, stock maintenance and in conserved fodder and subtracting the energy in "brought in" supplements. An average energy value for pasture can then be used to calculate the amount of pasture consumed. This measure of consumption is used as an indicator of whether pasture utilisation is increasing.

This is a useful benchmark for individual farmers and the industry, and it is believed it has been widely and uniformly adopted across the dairying regions in Victoria as part of the Target 10 program and in consultancy groups. As illustrated in Table 2, the variation in pasture consumption per hectare among farms is substantial.

While calculation of the amount of pasture consumed is not precise, it enables farmers to estimate the balance between milk produced from pasture and "brought in" supplements. Effective use of pasture remains the key to Victorian dairy farmers maintaining their competitive advantage. Clearly, increasing stocking rate is very much about increasing pasture consumption (and presumably pasture utilisation) and is also a key driver of profitability. However, increasing stocking rates or levels of milk production per cow lead to increases in feed or energy gaps across the year (Fig. 4), with a consequent need for increased use of conserved fodder or brought in supplements.

Supplement use in dairy production systems has increased markedly since the early 1980s (5). In grazing systems, emphasis in the first instance should be on providing the additional energy required for target levels of milk production. Once this need has been satisfied, consideration of requirements for other nutrients may be warranted, particularly where high levels of milk production per cow are the objective of the farmer.

In some ways, supplement use, particularly to provide nutrients other than energy, has increased in advance of the base knowledge on how to efficiently combine supplements with pasture in grazing systems. Much of the information used has come from indoor feeding systems, and it is questionable if it can be directly applied to grazing systems. For example, it is not possible to "balance" nutrients in the diet of a grazing cow (for given levels of production) without knowing what she selects and ingests from pasture. Our ability to predict intake and selection from pasture, while improving is incomplete (5, 12).

In the study of water use efficiency in northern Victoria, when average prices for inputs and outputs were used to allow a comparison of different production systems independent of individual purchasing opportunities and sale prices for milk, there were interesting relationships between income net of feed costs and proportion of energy supplied in supplements (Fig. 6).? This analysis indicated farmers with low or high supplement use could be found in the efficient (above the higher horizontal line) or inefficient groups (below the lower horizontal line).

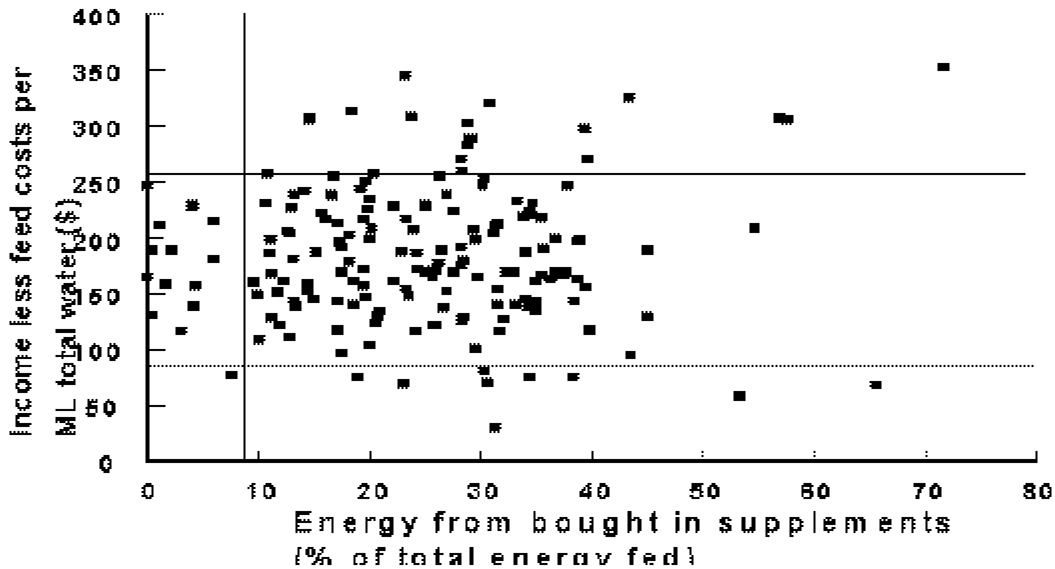


Figure 6

Natural resource management

To enhance its clean-green image the Victorian dairy industry is promoting adoption of "best management practices" to meet the environmental targets set by Catchment Management Authorities and expected by the community and customers. Self regulation is viewed as a more effective means of achieving change than imposed regulation.

Current "best practices" have been documented for management of nutrients and effluent and for water use efficiency. One remaining challenge is to integrate the existing recommendations into a single coherent set of guidelines, which deal with both natural resource management and productivity issues. This will involve compromises where recommendations for optimal manage- ment from an environmental perspective and from a production and short term profitability perspective differ. In the long term such compromises or balances in decision making will be essential for sustainability.

A greater effort in extension and promotion of "best practices" can be expected to increase adoption and change at the farm level. It will be essential this effort is industry led, and there will be increased use of case studies and monitor farms to enhance discussion, understanding and adoption. Increasingly farmers will use tools, such as codes of practice, to measure their performance and as a first step in moving towards quality assurance systems for environmental management.? There is no doubt that the performance of the industry in various regions will be benchmarked to measure improvements and that individual farms will have to document their practices.

Milk quality

A voluntary on-farm quality assurance program is being developed jointly by farmers, processing companies and the DRDC. The project is developing and documenting guidelines for farmers, which set out an approach to producing milk of consistent quality. The guidelines have been tested on farms and the on-farm milk quality assurance program will bring the Australian industry into line with the New Zealand dairy industry and the Australian beef and wool industries.

Issues and strategies to achieve further advances in the Victorian dairy industry
The Boston Consulting Group (1993) found, not surprisingly, that the ingredients for continuing success of the dairy industry were:

- to control increases in farm overhead costs (particularly shed & administrative costs);

- to re-evaluate the focus and structure of farm extension and consulting services;
- to evaluate increased use of one-on-one consulting formats to complement discussion groups;
- for companies to proactively manage down the costs of their suppliers; and,
- to assess options to encourage farm consolidation and transfer of farms between generations.

There are also broader environmental issues the industry must address. Catchment Management Authorities (CMAs) in Victoria have or will establish environ- mental/quality targets for water, nutrients and effluent. It is imperative that regional dairy industry groups (Gipps Dairy, WestVic Dairy, Murray Dairy) and stakeholders work closely with CMAs through this process.

The success of the Victorian dairy industry to date has been achieved through integration of the planning, management and delivery of programs to farmers. Future strategies for the industry will include:

Goal setting - CMAs have set environmental quality targets,

- the Victorian Government has set targets for export income (from $1.4 b in 1996 to $2.4 b in 2001),
- more farmers will set and plan for long term business goals.

Coordination of resource use and information delivery to farmers

- improved property management planning delivered as Farm$mart in conjunction with Target 10,
- a focus on best management practices for resource (nutrients, water, waste control) management and use
- information packaged to farmers needs through industry driven programs, such as Target 10,
- an integrated education program encompassing apprenticeships/traineeships, accredited courses for farm managers, suppliers of services and industry leadership
- a focus on skill development in a learning as opposed to training environment,
- effective coordination of activities an initiatives between CMAs, industry groups, Government agencies and other stakeholders,
- increased measurement of performance at industry and farm levels.

The role of the agronomist

Clearly there is a need to continuously improve the skills of decision making and management of complex biological systems at the farm level. This improvement is essential to better catchment management and a competitive Victorian dairy industry in years to come.

Both research and advisory agronomists have key roles to play in the future of this industry. However, the roles are changing, and all service providers need to be more customer focused than in the past. As with dairy farmers, it will also be important that agronomists continually evaluate their role and measure their performance.

Agronomists in advisory roles will require a broader knowledge, or will need to work with other specialists,? to integrate and tailor their agronomic messages for different production systems. They need to continually recognise that dairy farmers sell milk, not pasture.? Hence, they will not only need to recognise biological complexity, but they will need to account for the business complexity in decision making that farmers face.? It is inevitable that decision support systems which deal with both biological and business complexity will become more common. Farm advisers have a key role to play in the development and evaluation of these tools.? They will also need to suggest targets (goals) for improvement by individual farmers.

Research agronomists may have as their clientele the small proportion of the farmer population who are prepared to build a prototype. A new idea or innovation may need 10% acceptance before it has the impetus to make substantial change possible. Clearly, advances in productivity of dairy system(s) are needed. While many farmers want to see a "real" farmer make it work before they will use it, it is important that scientists interact with their clientele, to harness and test ideas, to market their work and pronounce their successes. Research scientists are often seen as doing the job for their own sake, and are certainly not renowned for publicising their achievements.

As with advisers, researchers will need to better understand the complexities outside their immediate sphere of expertise and will contribute to the development of decision support systems. This does not preclude a role for specialists, but such roles will need to be in a team framework, where effective contributions and links to practical outputs are ensured.

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