

Dairy Directions – Analysing Farm Systems for the Future

Providing robust analysis of the impact of on-farm changes and innovation on the profitability of dairy farm systems

Project Objectives

- ◆ Analyse options for dairy farms to maintain and increase profit, net worth and manage risk under:
 - Fluctuating milk price and real increases in input costs
 - Climate change projections and related policy changes
 - Increasing land values, which impact on the expansion of dairy businesses.
- ◆ Disseminate information generated from the project to inform influential farmers, service providers and policy groups of options to optimise profit and manage risk.



Project Results

Economic feasibility of irrigation re-use systems on farms

This study investigated the economic feasibility of installing an irrigation re-use system on a dairy farm in the Macalister Irrigation District (MID). The main measures used to assess the profitability of re-use systems were real internal rate of return (IRR), net present value (NPV) at a 10% discount rate and years for cash flow to break even.

In consultation with a farmer steering committee and industry specialists, costs for each major aspect of installing a re-use system were estimated and some general assumptions made. For example, water re-use was estimated on an annual basis and there was always enough run off to operate the dam. Construction costs were based on several variables, including construction of the dam, installation of pumps and pipes, application and land survey fees, and fencing of the system.

Two dam sizes, 6 ML and 9 ML; and three water re-use rates, 10, 15 and 20% of total water applied, were analysed. A sensitivity analysis was conducted to determine the minimum average pasture response to a megalitre of irrigation water (t DM pasture consumed/ML). Installation of a re-use system was considered a good investment if a real IRR (excluding inflation) of 10% or more was achieved.

The results indicate that installing a re-use dam is a good investment for an irrigated dairy farm in the MID, and a real IRR of 10% or more could be achieved. All scenarios generated an IRR of at least 10%, except the 6 ML dam size where only 10% of water applied was reused. As more water is re-used, the amount of pasture consumed per unit of water required to justify the investment, and generate an IRR of 10% or more, decreases. If low water re-use occurs, a significantly higher amount of pasture consumed per ML is needed to achieve the same return.

Installation of a re-use system was particularly attractive when fodder prices were high. Even when a low percentage of water was re-used and a low pasture response assumed, higher fodder prices were able to justify the investment and generate an IRR of 10% or more.

A technical bulletin on the economic feasibility of re-use dams is being developed and will be available soon.

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Communication activities

From July 2009 to February 2011, the project team has conducted or been involved in 39 events and presentations to over 1100 industry stakeholders (315 internal DPI staff and 828 external stakeholders).

The Dairy Directions project continues to provide valuable analysis that is used by the DPI Natural Resource Management and Climate Change Policy branch. Some specific examples are the :

- ◆ Murray Darling Basin Plan (MDBP) and the impacts of uncompensated Sustainable Diversion Limits.
- ◆ Economic impacts of heat stress in dairy cows.

Recent events and presentations by the project team include:

- ◆ A workshop to 60 dairy business service providers in Warrnambool on making decisions about change in dairy farm businesses. The project team challenged the participants to come up with the 'best' option for a case study farm in south west Victoria. On average, participants rated the content of the workshop 8/10 with 84% indicating they are quite likely to use the information with their clients. A quote from the day *"(I will use the information to) ask my clients more future planning goals/targets and quiz them on how they think they would achieve this."*



- ◆ The WestVic Dairy News have published three articles (November 2010, December 2010 and January 2011) that included key results from the south west case study analysis.
- ◆ Will Dalton presented findings from the Murray Darling Basin Plan Taskforce to 40 DPI Farm Services Victoria staff in December 2010. The presentation highlighted the impacts of the Basin Plan on two dairy case study farms from the project.

- ◆ Bill Malcolm and Christie Ho contributed to the 'Stretch your mind' information sessions held at Numurkah and Cohuna that attracted 33 participants (27 farmers, 6 DPI staff). Examples from the Dairy Directions project were used to help the participants better understand some of the recent changes in water policy.
- ◆ In February 2011, the Farm and Environment working group in northern Victoria invited Christie Ho to talk about the profitability of sub-surface drip irrigation for grazed pasture and lucerne conservation. Christie presented to 22 people, including DPI staff, farmers, irrigation industry consultants and representatives from Catchment Management Authorities.



- ◆ Three farmer workshops to present and discuss results from the project were held in south west Victoria in February 2011. The workshops were hosted by farmer discussion groups in the Heywood, Port Campbell and South Ecklin areas and were open to other farmers in the region. Sixty-four farmers and 37 service providers attended the workshops. The project team encouraged the audiences to explore the relative merits of each of the options for the case study farm.



Project activities

- ◆ A partial budget analysis for installing an irrigation re-use system on a dairy farm in the Macalister Irrigation District (MID) has been completed.
- ◆ An analysis to assess the impact of different milk pricing structures on milk income is being conducted for a case study farm in West Gippsland.



- ◆ The project team has worked collaboratively with the DairyMOD project to determine the impacts of climate change in the Gippsland region. DairyMOD estimated the change in pasture consumption under five climate scenarios: 'long-term average', 'past decade', '+ 1°C and -10% rainfall', '+ 2°C and -20% rainfall', '+ 3°C and -30% rainfall'. These outputs were then used to assess the economic impact on a Gippsland Dairy Directions case study farm.



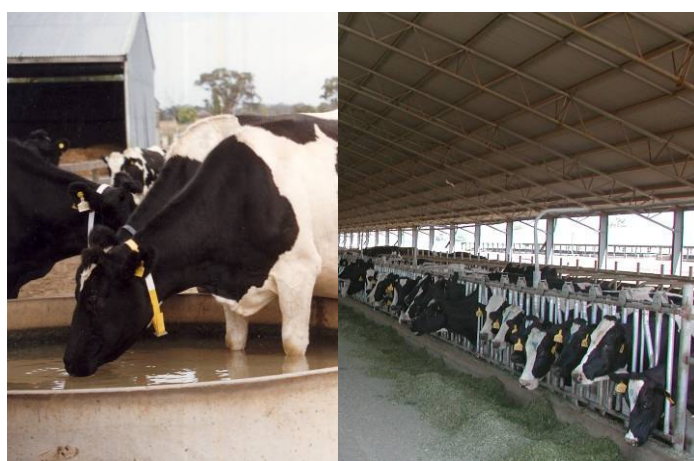
- ◆ Following a request from the Steering Committee, the effect of different starting equity positions (30%, 65% and 80%) on each of the development options for the south west case study farm were investigated. This reflects the range in equity positions across the region. The analysis showed that starting equity was critical to the viability of the farm business under different options. Higher starting equity, particularly in the first few

years after a development option, enabled the business to better manage poor seasonal conditions coinciding with low commodity prices and high input prices.

- ◆ Collection of financial and economic data for the new northern Victoria case study farm has been completed. Collection of biophysical data is continuing. Monthly lactation curves have been developed to determine energy requirements for the cows over a 12 month period. The base farm will be defined and documented by June 2011, and be used to answer research questions about farm flexibility and options for farmers if water allocations returned to 100% in future.



- ◆ Analysis of the economic impact of heat stress in the dairy industry is progressing. Heat stress is a complex issue with a number of potential impacts, for example, it could affect intake, fertility and level of milk production. The northern Victorian steering committee has suggested that it would be useful to develop a decision tree to help farmers think about innovations to reduce heat stress and whether to invest in particular options.

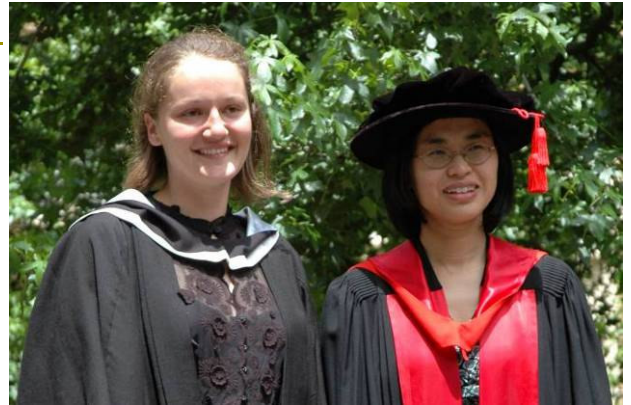


- ◆ The impact of reductions in Sustainable Diversion Limits outlined in the Murray Darling Basin Guide were tested on two northern Victorian case study farms. The results of the analyses were used in a submission by the Victorian Government to the Murray Darling Basin Authority.

Staff achievements

Christie Ho, Katherine Tarrant and Clare Leddin

Congratulations from the project team and steering committee members go to Christie for completing her PhD “Profitable irrigated dairy farming systems: exploring efficiencies in feeding systems with decreasing water availability”, Katherine for completing her Honours thesis “Investigating intensification for a high rainfall Gippsland dairy farm” and Clare for her Masters “Efficiency of grain supplementation in pasture-based dairy production systems.”



Recent Publications

Armstrong DP and Ho CKM (2011) Economic analysis of automatic flood irrigation for dairy farms in northern Victoria. Paper submitted to the AFBM Journal.

Tarrant K and Malcolm B (2011) Open to ideas: Information flows from Dairy Directions to dairy farmers. Paper presented at the 55th Australian Agricultural and Resource Economics Society Conference, Melbourne, Victoria. (Paper available for download from <http://ageconsearch.umn.edu/>)



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