

### 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**

##### **Sub surface drip irrigation for lucerne production**

Declining irrigation water availability has put significant pressure on dairy farmers to use water more efficiently. This has led to increased interest in:

- ◆ Alternative irrigation methods to flood irrigation, such as the micro-irrigation technology sub-surface drip irrigation (SSD), and
- ◆ Alternative forage systems to perennial ryegrass, such as lucerne.

Sub-surface drip irrigation can reduce evaporation losses, and also has the potential to deliver significant labour savings.

Using a partial budget analysis (over a 10 year period), a case study farm in the Goulburn Irrigation Region was selected to investigate whether conversion from flood irrigation to SSD irrigation to grow lucerne for hay/silage was a good investment.

The analysis carried out suggests that unless both water savings and extra lucerne yield are obtained, SSD is unlikely to be a wise investment. Without any water savings, a 6 t DM/ha increase in the amount of lucerne conserved, valued at \$400/t DM, could generate an internal rate of return of about 17%. However, this scenario is unlikely to occur consistently.

There were a number of combinations of increased yield and water savings that indicated SSD for lucerne hay/silage could be an attractive investment. Most of these involved an extra 6 t DM/ha conserved and some water savings. For a yield increase of 3 t DM/ha, substantial water savings of highly valued water would be needed for SSD to be an attractive investment for lucerne hay/silage.

Testing whether such improvements in technical efficiency are likely may warrant further research. It is also important to investigate whether other species, such as maize, have greater potential for improvement in yield with SSD.



## Project activities

- ◆ A case study farm in south-west Victoria has been selected to explore development options that would enable the business to remain profitable in the 5-10 year timeframe. The four development scenarios being investigated are:
  - ➔ Optimise the current farm system
  - ➔ Expand the milking area
  - ➔ Expand milking area and milk more cows, and
  - ➔ Self reliant system

The analysis is currently being finalised and results will be published in media articles, and presented to service providers and farmers at workshops in late 2010/early 2011.



- ◆ The Gippsland case study farm was used to compare the price that could be paid for an outblock compared to additional milking area, to achieve similar profit outcomes. The analysis suggests that milking area is worth between \$2,000 and \$3,000 more than outblock area. This is due to inefficiencies with conserving, transporting and feeding back conserved fodder from the outblock.
- ◆ The project team has collaborated with the DPI Natural Resources Management and Climate Change policy group to assess the potential impact of Sustainable Diversion Limits (SDLs) on dairy farms in northern Victoria. The project team are in a position to undertake further analysis when the draft Murray Dairy Basin Plan is released and additional details about the SDLs are known.
- ◆ An economic analysis of subsurface drip irrigation for lucerne production (for conservation) has been conducted. A technical bulletin summarising the results has been developed and can be downloaded from <http://www.murraydairy.com.au>

## Communication Activities

- ◆ Project findings have been presented to 150 farmers and service providers across the state. Events held between August and December 2009 include:
  - ➔ Three ONFARM discussion groups at Leongatha, Wonthaggi and Yarrum
  - ➔ Two Bankers and Accountants Workshops at Ellinbank and Warrnambool
  - ➔ A farmer group meeting at Tallangatta
 The primary purpose of these activities was to increase knowledge and awareness of project results, and enable more robust decision making on-farm.
- ◆ The project team presented an update of project activities to Dairy Australia and the Regional Development Program Boards (Murray Dairy, GippsDairy and WestVic Dairy) in August and December 2009.
- ◆ Information generated from the project was used at 29 'Managing the challenge' shed meetings held in September 2009. Approximately 280 people attended at various locations across the northern irrigation region.



- ◆ Katherine Tarrant and Melanie Porcher presented conference papers at the Australian Agricultural Resource Economics Society Conference, Australian Dairy Conference, and Australian Society of Animal Production Conference. The papers can be downloaded from <http://ageconsearch.umn.edu/handle/59164> and <http://www.publish.csiro.au/nid/72/paper/AN10009.htm>.

## Communication Activities (cont'd)

- ◆ Christie Ho and Will Dalton gave a presentation to DPI Economists on project activities related to water at a conference held in Alexandra in November 2009.
- ◆ Will Dalton provided an overview of the work carried out on Northern Victorian Irrigation Renewal Project (NVIRP) connection options to the DPI Deputy Secretary for Policy and Strategy in November 2009, DPI northern Victorian extension staff in May 2010, and DPI Secretary in July 2010.



- ◆ Technical bulletins for farmers and service providers, based on findings from the project, have been developed and are available on the Murray Dairy website at <http://www.murraydairy.com.au>. Bulletins released since July 2009 include:
  - ➔ Once-a day milking—Does it pay? (October 2009)
  - ➔ Automatic cluster removers—Do they pay? (October 2009)
  - ➔ Subsurface drip irrigation in pasture production—Does it pay? (November 2009)
  - ➔ Subsurface drip irrigation for lucerne production (August 2010).



## Related Activities

- ◆ Dan Armstrong and Katherine Tarrant worked with Andrew Alford (DPI NSW) to apply the economic analysis of Automatic Milking Systems to the Gippsland case study farm. The analysis indicated that Automatic Milking Systems needed to be significantly cheaper before the investment could be justified.
- ◆ Katherine Tarrant spent 6 days with a farmer-based Cooperative Research Group developing a dynamical systems model for key interactions within a dairy farm system, and between the dairy farm system and commodity/environmental systems. The scientists also spent a day with the Dairy Directions project team to gain an understanding of the model used in this project, including the assumptions underlying the relationships in the system.

## Current and Upcoming Activities

Current and upcoming activities in the project include:

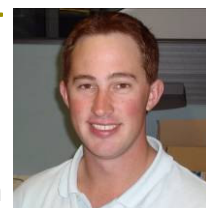
- ◆ Analysis of the biophysical and economic impact of changes in rainfall and temperature, as predicted under climate change, on pasture production in Gippsland.
- ◆ Estimation of carbon emissions from dairy farms, using DGAS, a dairy greenhouse gas abatement calculator.
- ◆ Investigation of the economic impact of heat stress on farm businesses in northern Victoria, and how the incidence of heat stress could change with climate change predictions.
- ◆ Evaluation of the impact of water policy changes on dairy businesses in northern Victoria.
- ◆ Development of three new case study farms located in the Northern Irrigation Region, Macalister Irrigation District, and Gippsland (rainfed) region.
- ◆ Service provider and farmer workshops in late 2010/early 2011 in SW Victoria. These sessions will explore findings from the case study farm analysis.
- ◆ Exploration of opportunities for using this project's approach in other industries, such as lamb production.

## Staff changes

- ◆ Dan Armstrong resigned from DPI in January 2010.
- ◆ Ben Myers, a recent graduate from the University of Melbourne, has been employed to replace Dan. Ben started in April 2010, and is based in Ellinbank.
- ◆ After extended leave, Clare Leddin returned to the project in May 2010 .
- ◆ Melanie Porker has relocated to Ellinbank to begin the final rotation of her DPI Graduate Program.
- ◆ Yvette Williams has been employed to increase project capacity at Tatura. Yvette began in July 2010, and will be focussed on developing a new case study farm in northern Victoria.

## Staff Profile

### Ben Myers Research Scientist— Farming Systems



- ◆ Ben joined the team in April and is based at DPI Ellinbank. He will be working closely with Katherine Tarrant to conduct a case study analysis of an irrigated dairy farm in the Macalister Irrigation District (MID) region. He is also working with Christie Ho to gain an understanding of Northern Irrigation Dairy farms and learn how analysis from northern Victoria could be adapting for the MID.
- ◆ Ben graduated from The University of Melbourne with a Bachelor of Agricultural Science (Hons.) in 2010. This is his first position with DPI. Originally from a potato, sheep and cropping farm, north of Ballarat in Central Victoria, Ben looks forward to gaining a comprehensive understanding of the dairy industry, and working with other team members to further develop skills and knowledge.

### Team Contacts

Bill Wales (Project Leader)	Ellinbank	(03) 5624 2227	bill.wales@dpi.vic.gov.au
Katherine Tarrant	Ellinbank	(03) 5624 2222	katherine.tarrant@dpi.vic.gov.au
Melanie Porker	Ellinbank	(03) 5624 2222	melanie.porker@dpi.vic.gov.au
Ben Myers	Ellinbank	(03) 5624 2222	ben.myers@dpi.vic.gov.au
Mike Morris	Tatura	(03) 5833 5283	mike.morris@dpi.vic.gov.au
Christie Ho	Tatura	(03) 5833 5396	christie.ho@dpi.vic.gov.au
Yvette Williams	Tatura	(03) 5833 5375	yvette.williams@dpi.vic.gov.au
Marg Jenkin	Tatura	(03) 5833 5381	marg.jenkin@dpi.vic.gov.au
Janna Heard	Hamilton	(03) 5573 0946	janna.heard@dpi.vic.gov.au
Clare Leddin	Warrnambool	(03) 5561 9939	clare.leddin@dpi.vic.gov.au
Will Dalton	Melbourne	(03) 9658 4821	will.dalton@dpi.vic.gov.au
Bill Malcolm	Parkville	(03) 8341 2440	bill.malcolm@dpi.vic.gov.au



Published by the Department of Primary Industries, July 2010

© The State of Victoria, 2010

This publication is copyright. No part may be reproduced by any process except in accordance with the provisions of the *Copyright Act 1968*.

Authorised by the Victorian Government, 1 Spring Street, Melbourne 3000

#### Disclaimer:

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

**For more information about DPI go to [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au) or call the Customer Call Centre on 136 186.**