



ACCELERATING CHANGE

TRANSFORMING DAIRY FOR A PROFITABLE FUTURE

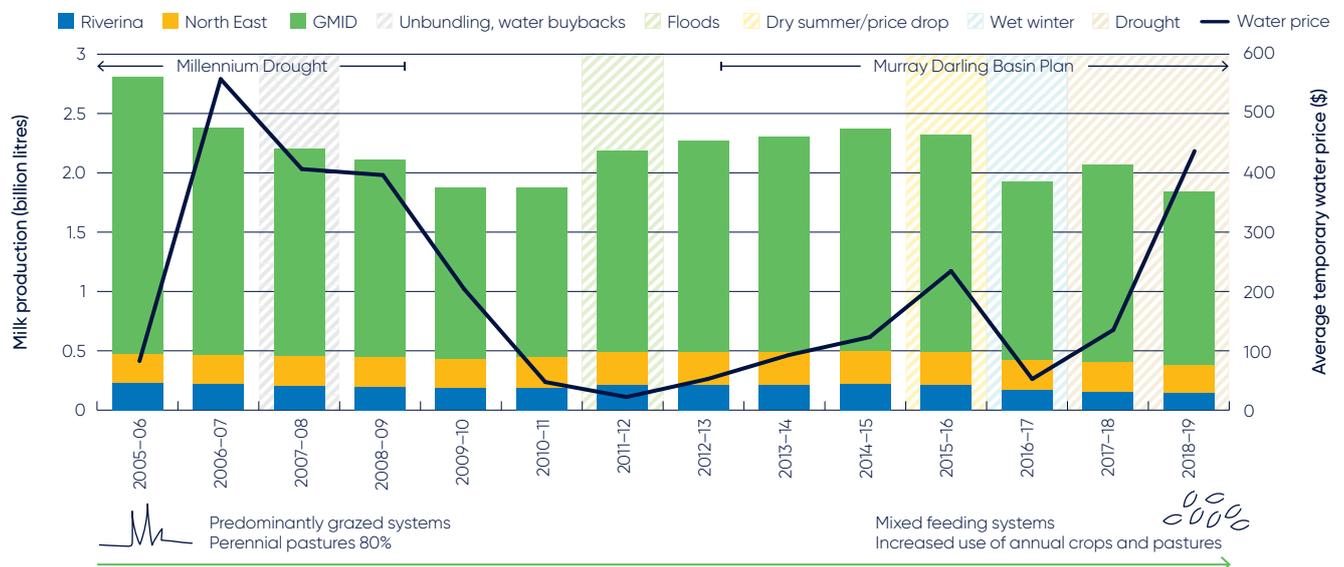
RESEARCH FINDINGS

Dairy businesses must be profitable, resilient, efficient, and competitive. In the Murray region managing a dairy business has become increasingly complex due to rapid change in the operating environment. Successful operators need to adapt by making informed decisions and managing risk. Accelerating Change was the break-through program for the dairy industry delivering information and tools to achieve this.

A changing operating environment

Dairy farming in the Murray region has transformed since the Millennium Drought (1997-2009). Change drivers include the 2012 Murray-Darling Basin Plan and State policy reforms; increased water market competition; irrigation district modernisation; advances in research and technology; climate change; rising input costs; volatile seasonal conditions; and volatile commodity markets.

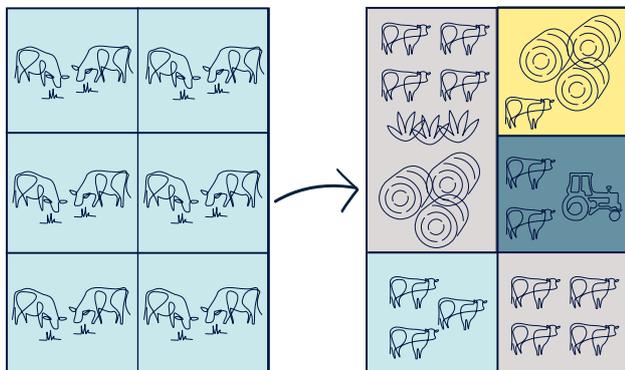
Figure 1 Total annual milk production, average temporary water price and changes experienced by operators in the Murray Dairy region



Farm systems in irrigation districts are consequently diversifying away from a historical reliance on intensively irrigated pastures supported by cheap plentiful water towards more diverse and flexible feedbase systems capable of responding to increasing water and market variability and volatility, including more summer active perennials annual forages and crops.

Farms across the region are also highly variable, with differences such as climate, soil type, scale, production, infrastructure, feedbase, access to water and access to fodder all influencing, the way operators respond to changes in the operating environment.

Figure 2 Increasing diversity of farms and feedbase in the Murray Dairy region



The project was a starting point for all industry stakeholders to get behind a longer-term strategy for dairy in the region improving the consistency, quality and confidence in investment RD&E and communication.

Why Accelerating Change?

Many dairy farmers made significant adjustment through this period of change; others were making decisions informed by 'rules of thumb' developed when water was cheap and plentiful. Feeling their way through a changing operating environment through trial and error, operators were looking for guidance informed by good research and extension.

With variability becoming the 'new normal' Accelerating Change was the vehicle needed to shift gears from responsive decisions based on seasonal conditions to proactive planning for diverse climate and water availability scenarios. It provided business strategies and risk management insights to drive profits and resilience, and new research and technologies to maximise feedbase and irrigation efficiency.

Of all the strategies & technologies evaluated by the project, system-based innovations linked to mitigating new operating risks had the biggest impact on farm profitability and resilience. These included:

- substituting perennial pastures for an equivalent quality forage type with a higher return on water
- utilising forages that cope better with drier, hotter temperatures and variable irrigation scheduling
- making whole-of-system changes (i.e. adoption of partial mixed ration feeding systems) to reduce reliance on irrigation during dry periods

Accelerating Change: the project

Murray Dairy delivered Accelerating Change between February 2015 and June 2018, in partnership with Regional Development Victoria, Dairy Australia, and AgVic in the then Victorian Department of Economic Development, Jobs, Transport and Resources (now Jobs Precincts and Regions). Funding for the project was provided by The Murray-Darling Basin Regional Economic Diversification Program administered by Regional Development Victoria with co-contributions from Dairy Australia, Murray Dairy and Agriculture Victoria.

Objectives

- Increasing farmers' and agronomists' knowledge of the potential yields, quality, water demand and cost of growing different feeds.
- Using improved farm data to sharpen farmers' critical thinking to optimize soil health and address subsoil constraints commonly found in irrigated dairy soils affected by livestock traffic, earth moving and continual wetting.
- Providing clear integrated information on flexible alternate feeding strategies.
- Increasing dairy farmers' and service providers' use of the Agriculture Victoria irrigation research and capability.
- Increasing dairy farmers' capability to grow crops and integrate them into the farm system.
- Building up the capability and strength of the service providers' network to support dairy.

What we found

Adaptation needed a more nuanced approach than just increasing home-grown pasture. Strategies to increase conserved feed and integrate more water-efficient forage species led to increased water-use efficiency lower feed costs and lower cost of production. This was supported by improved irrigation scheduling, agronomic management and remediation of soil constraints. In particular:

					
Alternative forage types and different feeding systems increased water-use efficiency 1.5tDM/ML to 2.0tDM/ML (tonnes of dry mater per megalitre)	Home-grown conserved feed increased from 1.7 t DM/ha to 1.9 t DM/ha or by 12%	Over the life of the project home-grown grazed pasture decreased by 15% as a response to water availability and pricing	Home-grown feed costs fell from \$145 t/DM to \$130 t/DM for direct grazed feed	Costs fell from \$224 t/DM to \$202 t/DM for conserved feed	Dairy businesses' cost base shrank 6%

The project found that individual businesses varied widely in their ability to cope with volatility. Farm system debt, water security, decision making ability, and skills affected the capability to deal with sudden changes. However common characteristics were identified among businesses that successfully navigated challenging climatic and market conditions.

				
GOALS	INFO	EXPERTISE	CAPABILITY	REVIEW
To maintain focus in a changing environment Assists decision making when resources are limited and farmers are faced with competing priorities Ensures that all stakeholders agree about where the business is going and how it is going to get there	Without information to support decision making farmers tend to revert to habit or gut-feel Information can help to identify opportunities and constraints - it assists in planning and management decisions	It takes a team to navigate change Increased complexity in farming systems requires specialised knowledge in different areas of the business Sharing decision making and using specialised knowledge is a risk management strategy	Skills must evolve as business models evolve Upskill or bring skills into the business in preparation for change	A process of reviewing and evaluating ensures that business strategy continues to meet goals Business strategies or models may need to evolve to respond to the operating environment

The project also evaluated various technologies and their capacity to contribute to increased profitability and resilience in a changing environment. The best technologies provide data to inform decision making and improve management through more accurate and timely information.

What we did

The project comprised two partner farms, each supported by up to 15 satellite farms, to evaluate forage types and production practices; quantify costs; and boost yields and returns on irrigation. Research and technology was applied on the partner farms and spot tested on the satellite farms.

Extension activities and communication materials then spread the insights and learnings to more than 1000 dairy farmers and service providers across the Murray region. These activities are ongoing beyond the life of the project.

IN TOTAL THE ACCELERATING CHANGE TEAM DELIVERED:

29 workshops

8 field days

46 technical news articles and factsheets

90 presentations

101 social media pieces

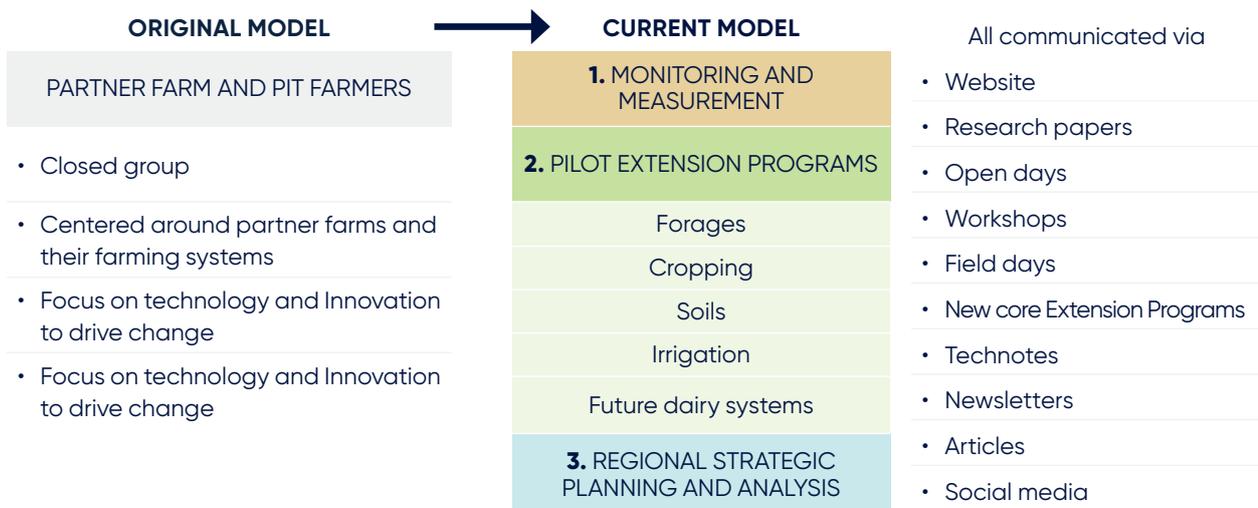
Accelerating Change extension events inspired all attending farmers to go home and make changes, with 25 per cent indicating immediate change and 75 per cent within a year.



Innovative extension programs

Shifting from a whole-farm approach, which farmers felt did not offer enough relevance or specificity to their business, topic-based extension programs were piloted across various management areas including feedbase, soils, irrigation and business strategy.

Figure 4 Change of the model used to deliver the Accelerating Change project



Farmers chose the adaption strategy topics that best fit their business and like-minded groups formed around each topic, supported by specific and high-level technical expertise. Technical messaging was focused on key decision making processes to ensure that farmers were supported to evaluate the adaptation strategy best suited to their business and understand key aspects of new or different practices to ensure adoption was effective and efficient.

Extension programs	Achievements
Successful Summer and Winter Cropping	<ul style="list-style-type: none"> • Five-part cropping program developed • Engaged 130 farmers & service providers • 2 YouTube clips • 1 podcast • 2 cost calculator tools • 4 technical articles
Lucerne Masterclass	<ul style="list-style-type: none"> • 53 farmers and service providers • 2 technical articles
Understanding and Managing Soil Constraints	<ul style="list-style-type: none"> • 17 soil pits utilised on 11 sites across the region • 1 technical soils report on common soil constraints for dairy in the region • 6 technotes • 1 technical article • 2 YouTube videos
Improving irrigation efficiency	<ul style="list-style-type: none"> • Regional data on water use by different feed types under a range of scenarios • Trial of various soil moisture monitoring technologies • Weekly ETo updates for irrigation scheduling with an irrigation scheduling tool • 6 technical articles • 6 technical presentations (Partner Farm & PIT Farms) • 2 irrigation scheduling analyses (2015-16 2017-18) • Cotton Innovation Tour
Direct service sector engagement	<ul style="list-style-type: none"> • Agronomy Network established and still operational • Over 70 agronomists connected through 4 Agronomy Network meetings • Work placements for 2 final-year university students both now employed in the dairy industry
Flexible Feeding Systems for All Season	<ul style="list-style-type: none"> • 2 irrigation scheduling analyses (2015-16 2017-18) • Cotton Innovation Tour
Risk Management and Strategic Planning	<ul style="list-style-type: none"> • 6 farm businesses participated in the Plan2Dairy Pilot program • Presentation to over 150 farmers & service providers at the 2017 Australian Dairy Conference • Murray Dairy's Future Focus dairy industry strategy



Monitoring and measurement

Monitoring and measurement on the two project partner farms in Tongala and Yarrowalla, and two satellite farms in Tongala and Dhurringile, were critical to understanding the performance of regional feedbases and identifying opportunities to improve performance. Monitoring and measurement included:

- Testing and evaluating different soil moisture monitoring technology.
- Measuring accumulation and nutritive characteristics of pure perennial ryegrass, perennial ryegrass and paspalum, annual ryegrass, lucerne, sorghum and fescue.
- Economic analysis of different forage performance on-farm.
- Agronomic analysis of farm decision making.
- Physical and economic impact analysis of different irrigation strategies on Lucerne and perennial ryegrass.
- Soil moisture monitoring to evaluate the relative effectiveness of different technologies on shallow-rooted perennial ryegrass.
- Regionally specific calibration of automatic pasture reader.

The program provided data to help inform feedbase management, irrigation management, nutrition budgeting and seasonal business decisions, and provided information on the performance of different forage systems for the broader industry.

Data was also used to ground-truth previous research; for example, irrigation intervals for forages and the nutritive characteristics of pastures were found to be within the range predicted from an existing state government perennial pasture database.

The team also assessed technologies including soil moisture probes and an Automated Pasture Reader to develop fit-for-purpose technologies for pasture and crop measurement.

Communications

The project trialled a range of communications mechanisms to support their extension programs including:

- Accelerating Change website, a one-stop-shop for data technical resources and tools
- 88 pieces of online content with over 10,000 touch points
- a bimonthly e-newsletter
- 9 Agronomy Reports
- 3 Research Reports
- 4 videos
- a podcast
- regular articles in industry publications & newspapers

The combination of more face-to-face delivery and high-quality, frequent and agile digital communications put a significantly larger and more diverse audience in touch with the benefits of Accelerating Change in their business and farm systems.

Strategic industry-level analysis

Accelerating Change undertook a strategic analysis of the region's opportunities and challenges and planning for effective short- and long-term responses. Key bodies of work included:

- *Optimal decision making to drive resilience* presentation to 2017 Australian Dairy Conference
- Two forums involving industry stakeholders in discussion around direction and strategy for the regional dairy industry: Industry Futures Session and Dairy Summit
- Links to six additional research projects and contribution to several others.
- Cross-sectoral networks with cotton rice and irrigated cropping industries.

RECOMMENDATIONS

The following recommendations emerged from the Accelerating Change project. They are explored in more detail in the Future Focus - Regional Dairy Industry Strategy 2019.

1. More investment in farm systems to support risk mitigation

Focus on the divergence of farming systems away from predominantly irrigated pasture towards a more diverse feed base.

Research development and extension investment to focus on optimising Partial Mixed Ration (PMR) and Total Mixed Ration (TMR) systems.

Incentivise investment that supports new farm practices farm systems and risk mitigation strategies such as feeding infrastructure and feeding storage facilities

Programs to improve farm business skills to proactively manage and reduce input costs and risks

Programs to increase farmer understanding of the cost/benefit of investing in new WUE practices and farm systems

Cross collaborative and local investment to support further adaptive strategies i.e. integrating alternative forage types and crops; improving soil health; and improving irrigation efficiency risk management and strategic planning.

2. Service provider training and professional development

Continued investment in service provider training to ensure farms have access to high quality specialised technical expertise and industry has effective channels to improve understanding of on-farm challenges and disseminate research and information.

Programs/courses to train current and new generation of agronomists nutritionists and other advisors in skills in diverse farm systems and transitions

3. More research on current and future drivers of change

Expand research into the operating environment and corresponding drivers of change.

Make climate and market forecast information in a readily available format that can inform on-farm decision making



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