

Rural Water Use Efficiency for Irrigation Futures

Final report 2013–17



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Introduction

Rural water use efficiency programs were first implemented in Queensland in 1999 to assist the irrigation sector in improving the efficiency of on-farm water use, and to help transition irrigators through national and state government water reforms. The current program, Rural Water Use Efficiency for Irrigation Futures (RWUE-IF), is an industry-delivered, Queensland Government-funded program designed to promote water use efficiency on farms. This report covers the four-year RWUE-IF program from July 2013 to June 2017, and reports on the cumulative outcomes from the four years.

The overall aim of RWUE-IF is to improve the use and management of on-farm irrigation water in an effort to achieve improved productivity and sustainability of rural industries, support departmental initiatives and to achieve natural resource management outcomes. Assistance to irrigators is primarily provided through technical advice, irrigation system evaluations, limited financial assistance, field days, workshops and exposure to web-based technologies.

RWUE-IF adopted the overarching theme of 'precision irrigation' to promote and deliver the uptake of improved practices, efficient irrigation equipment and contemporary technologies. Delivery of services to irrigators is primarily on the basis of participation in their industry's best management practice (BMP) or farm management system (FMS) initiatives, through the adoption of relevant BMP/FMS modules.

Industry partners include CANEGROWERS, Growcom, Queensland Dairyfarmers' Organisation, Turf Queensland, Flower Association of Queensland, and Nursery and Garden Industry Queensland. Industry partners are supported by Irrigation Australia Ltd and the National Centre for Engineering in Agriculture (NCEA). They provide enhanced outcomes by improving the technical capacity of service providers to deliver competent services. Additionally they have developed and promoted the uptake of new technologies and practices.

RWUE-IF, and its unique framework, have produced valuable outcomes. RWUE-IF established close linkages with departmental programs such as water planning and the state-wide non-urban metering initiative. It focused in areas where the condition of land or water resources is degraded, or at risk of becoming degraded, through irrigation development.

The four-year program realised significant outcomes despite adverse weather conditions, including increasing drought conditions in many parts of the state and two cyclones with significant associated flooding.

This report was developed using information contained in milestones and final reports submitted by industry bodies and support organisations.



Horticulture crop SEQ (photo DNRME)

Dairy and fodder

The Queensland Dairyfarmers' Organisation

engaged with dairy and fodder growers in targeted areas including the Callide Valley, where irrigators are dealing with reduced water allocations. Growers are engaged through visits to demonstration farms, provision of on-farm technical advice, irrigation system assessments and performance-based financial incentives, and were encouraged to change irrigation and water reuse systems. Projects have achieved:

- water use efficiency gains of approximately 10 per cent of the dairy industry's existing water use
- an average of 47 per cent reduction in energy use
- 130 producers adopting improved water, energy or nutrient practices
- 10 training events involving 100 producers
- 72 water, energy and/or nutrient assessments and/or completed evaluations
- 44 enterprises receiving financial assistance for system change and improvements.

It is calculated that the Dairy and fodder project has delivered water use efficiency or productivity gains of 2991 ML per year. Extrapolated over the life of the program, this equates to a water use efficiency gain of almost ten per cent of the dairy industry's total water use. In addition, fodder growers have achieved efficiency gains of 1367 ML per year.



Centre Pivot Boonah (photo DNRME)

RWUE-IF Dairy and fodder case study: Goovigen demonstration farm

The Jordison family operates a 730 hectare dairy farm between Jambin and Goovigen, located on the flood plain to the north west of Biloela in the Fitzroy Basin in Queensland.

Approximately 25 hectares are under centre pivot irrigation, which is sourced from groundwater in the Callide catchment. Impacts of extensive flooding from Callide Creek and its tributaries caused damage to a hard nose boom irrigator in 2013. The DFWP program included a grant to assist dairy farmers to engage professional skills to assess on-farm irrigation and water reuse management systems.

The assessments highlighted the need for better energy and water efficiencies. Through consultation with DFWP, the Jordison family chose to purchase a Valley 180 metre centre pivot. The pivot was chosen to cost-effectively irrigate an area of up to 25 hectares at a lower operating cost per hectare than the previous system.

A post-implementation evaluation report of the upgraded system by DFWP was provided to the farmer based on the performance of the centre pivot system, so they could rectify any inefficiencies.

Data collected from the evaluation was highly accurate regarding water use and energy efficiencies derived from the project. In addition, the evenness of water application was improved, avoiding over or under supply in targeted areas, and enormous labour efficiencies were gained.

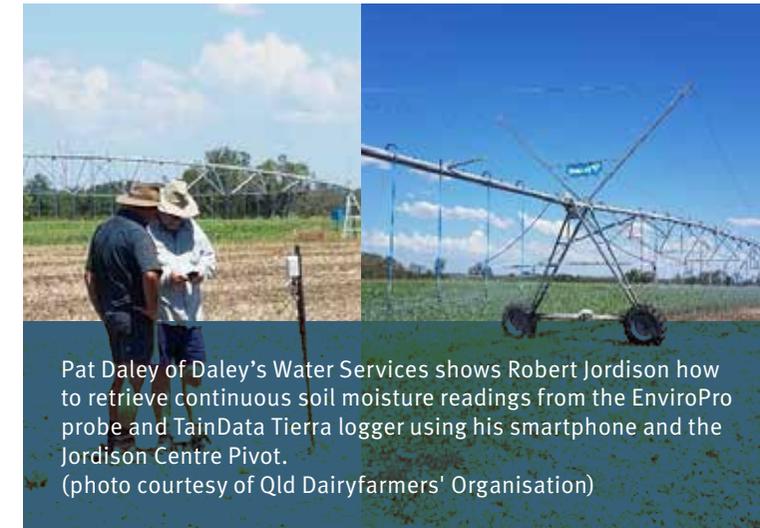
The assessment recommended that the farm should start scheduling irrigation events to avoid under or over watering. Results have significantly decreased pumping costs while increasing crop yields.

There are many tools available to assist farmers in scheduling their irrigation events. One approach is by measuring actual soil moisture. EnviroPro soil moisture probes were chosen for this demonstration site to continuously monitor soil moisture, soil temperature and soil salinity at intervals of 10 centimetres down the soil profile. Telemetry data logging provides continuous measurements, which are sent via bluetooth-capable TainData Tierra soil moisture data loggers to a smartphone and the web. Connecting to the EnviroPro probe gave the farmers the ability to make irrigation decisions 'on the go' via data retrieval from their smartphones.

"It was really interesting to see how the moisture profile changed and the soil temperature function was useful", said Mr Jordison. "Using the soil temperature data assisted with planting the summer sorghum crop a month earlier than would normally occur".

"The advice we received through the program was provided in a very clear and easy-to-understand, we changed the way we irrigated based on the data from the monitoring equipment and now water with 15 mm applications each week, rather than in large dollops".

"The installation of the soil moisture meter was a worthwhile project", Mr Jordison said. "My main expectation was to learn more about irrigation scheduling and how to better manage our precious water using the new pivot, and this expectation was certainly met".



Pat Daley of Daley's Water Services shows Robert Jordison how to retrieve continuous soil moisture readings from the EnviroPro probe and TainData Tierra logger using his smartphone and the Jordison Centre Pivot.
(photo courtesy of Qld Dairyfarmers' Organisation)



Robert Jordison, Goovigen (photo courtesy of Qld Dairyfarmers' Organisation)

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