



Closing the yield gap: Maximising Water Productivity on Irrigated Dairy Farms

1. What is the project about?

Optimised dairy irrigation farms established under Smarter Irrigation for Profit Phase 1 found most operators were not getting the basics right. Conducting annual system checks including pumps, getting the start-up time right and avoiding the 'green drought' increased water productivity by 40% on some farms.

On-farm audits of energy efficiency and irrigation uniformity (checking irrigation systems are performing as they were designed to) found big variations in efficiencies – even with recently installed systems. Energy savings of up to \$20,000/pivot were identified.

Working with farmers, researchers and agronomists the project team have established 10 farmer and service provider led 'optimised irrigation sites' on dairy farms in SA, WA, Victoria and NSW. Each site reference group has selected the irrigation skills and technologies they want to learn more about with a focus on the 'yield gap'.

Other selected areas of interest include pump efficiency, minimising energy costs, new irrigation scheduling technologies, water balance platforms and automated pasture measurement systems.

The 'optimised irrigation sites' are located on commercial farms, with sites located near Dardanup, Mount Compass, Mount Gambier, Mepunga East, Tongala, Maffra (Cobains), Yarram, Tocal, Bega (Jelgowry) and Casino (Coraki).



2. How will the demonstration sites benefit irrigators?

These sites provide an opportunity for irrigators to check their operating practices against good practice whilst building skills in how to manage existing irrigation systems more efficiently. They also provide an opportunity to assess new irrigation technologies and decision support platforms such as Pasture.io and IrriPasture and discuss their potential usefulness for their system. All sites are supported by experienced agronomists and irrigation consultants.

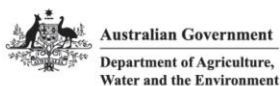
Cross sector and within industry bus tours to visit other industry irrigation farms and regions are a key feature of the project. These tours are open to all interested farmers and service providers.



3. Key results to date

For all sites, Season 2 presented a very different climatic scenario compared to Season 1, overall reducing the need for farmers to continuously irrigate, but increasing the need to monitor the effectiveness of rainfall events and irrigation timing, to maintain soil moisture within Readily Available Water (RAW). This season, farmers were more often than not faced with the decision to hold-off on irrigation, instead relying upon the arrival of predicted rainfall, to manage overly wetting or saturating paddocks.

The technologies applied to all sites during Season 1 have been actively used in the scheduling of irrigation (timing/rate) in Season 2. All ten sites continue to use the following technologies to inform irrigation decisions in collaboration with the farmer, site coordinator, site consultants (as applicable) and reference group members (as applicable): soil moisture monitors with telemetry (at least 3 per site), site rain gauges with telemetry (at least 1 per site), water balance platform IrriPasture (for pasture & now also for



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Smarter Irrigation for Profit PHASE II

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crops), Pasture.io (validation of NDVI as an accurate pasture monitoring tool) and SWAN Systems daily weather notifications (BOM 3 or 6 km grid modelling). Whilst the farmers are currently supported in managing and interpreting the information these technologies provide, they have reported that their confidence and understanding is increasing on how to input the required data, evaluate the need to irrigate using data outputs (reports & graphs), and evaluate the effectiveness of these decisions.

As the project has progressed, it has become evident that assessment of the performance of actions and strategies should be undertaken on an annual basis against the potential modelled yield for the pasture/crop of the site (20 year mean (Christie K., August 2020, Tasmanian Institute of Agriculture). To evaluate performance using a Season vs Season method does not consider the impact of seasonal variation (and therefore irrigation requirements) or farmer management decisions outside those relating to irrigation, especially grazing management.

Whilst GPWUI can often be used as a comparison between irrigation seasons, it does not account for seasons where over-supply of water during weather events of the irrigation season that result in flooding and run-off conditions. Whilst this rainfall data is used in GPWUI calculations, it is not fully available to the plant and likely also has an unquantified negative impact upon growth rate and yield per hectare. This is a scenario that prevailed at a majority of the sites in the wetter, cooler Season 2 compared to the dry, hot conditions in Season 1.

The reference groups of all ten sites are operating under varying models and supports to reflect the different needs and participatory response from farmers of the region. Whilst local farmers are interested in the information extended by the local site, the overall feedback is that ongoing engagement through monthly meetings is not the preferred method of extension at all sites. Where monthly meetings are not conducted, there is a preference for field days, workshops and regular short written reports through local newsletters that update on the Dairy Optimisation Site findings, share farmer experiences and provide upskilling on the use of the technologies. A succinct session format is the preferred method of extension.

For more information visit the [Smarter Irrigation for Profit](http://SmarterIrrigationforProfit.com.au) website and watch the webinars and videos:

- "Getting the Basics right" with Dr James Hills. Available at: <https://www.facebook.com/watch/?v=4948713698479246>
- "Irripasture". Available at: <https://www.facebook.com/DairyAustralia/videos/164997255766191>
- <https://smarterirrigation.com.au/using-soil-moisture-monitoring-and-data-to-maintain-readily-available-water-raw/>
- <https://smarterirrigation.com.au/pump-performance-webinar/>
- <https://smarterirrigation.com.au/weather-forecasting-and-soil-information-for-irrigation-decisions-webinar/>
- <https://smarterirrigation.com.au/andrew-tyler-a-dairy-farmer-from-northern-victoria-talks-about-innovation-in-farming-and-how-farmers-can-use-technology/>

Or visit the Dairy Australia website: <https://content-prod.dairyaustralia.com.au/en/land-water-and-climate/water/irrigation/smarter-irrigation-for-profit#.YBm8ZegzZyw>

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