



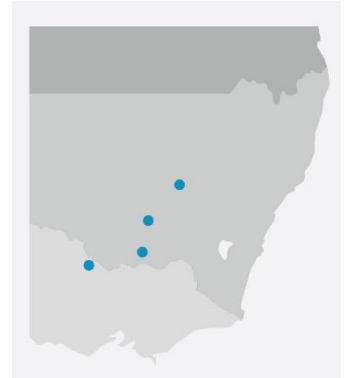
Closing the yield gap: Key Learning Sites Southern NSW (making the most of water)

1. What is the project about?

This project aims to increase water productivity and profitability by expanding growers' knowledge of irrigation technology and best practice management.

The project is grower driven with grower groups involved with the management and activities at each of the key learning sites located in the Lachlan, Murrumbidgee, and Murray valleys. A range of technologies are being used to demonstrate best practice management including soil moisture monitoring and automation. The aim being to optimise the limited availability of water resources to obtain maximum dollars per mega litre in a range of irrigated cropping systems.

Project sites are located near Condoblin, Kerang, Darlington Point and Finley.



2. Why do irrigators need to know about it?

In 2014 - 2017 64% of monitored crops in the Murray and Murrumbidgee Valley's should have produced higher yields based on the volume of irrigation water applied. Many of the irrigation crops monitored suffered from drought stress before the first spring irrigation reducing the yield potential of the crop. These sub-optimal yields could have been avoided through better paddock drainage, sowing early in the sowing window, matching row spacing to the target yield and better scheduled irrigations¹.



3. How will the research benefit irrigators?

The project aims to lift grower's knowledge so they can make more informed management decisions, optimising their return/ML water applied. Grower groups involved in the management of the sites are the Irrigation Research and Extension Committee (IREC), Central West Farming Systems (CWFS), Irrigated Cropping Council (ICC) and Southern Growers (SG).

An annual field day is being held at each of the key learning sites, in addition to inter-valley tours to enable growers from other regions to gain knowledge from work done outside their district.



A feature of the project is the establishment of the [Murray Valley Soil Moisture](http://murrayvalleysoilmoisture.site/) website (<http://murrayvalleysoilmoisture.site/>). The website provides real time information from soil moisture monitoring equipment installed at each of the Key Learning Sites (KLS) as well as two case study farms. The website allows growers to see how soil moisture data is used for scheduling irrigations, and how to monitor the effect and extent of rainfall events and plant growth on soil moisture.

¹ https://www.researchgate.net/publication/327828505_Soil_under_an_irrigated_environment_ICF_00008_final_technical_report_201



4. Key results to date

Central West Farming Systems:

In the 2021 season CWFS are investigating the advantages of using nitrogen fertilizer slow-release technology on canola in an irrigated system. Anticipated advantages come from reduction in trafficking of the paddock, better and more timely delivery of nitrogen to the crop and reduced nitrogen losses. CWFS successfully completed the field work in the 2020 winter season finding that sowing dual purpose crops early and grazing them to keep development in check was a good strategy in 2020. Not using grazing to delay development led to crops being very advanced and put flowering in the frost window. Economic analysis is being undertaken and an initial case study is available at: [CWFS Irrigation water in dry years. Sell, buy or apply.](#)

Irrigation Research and Extension Committee:

The 2020/21 season saw good water allocations which resulted in a full summer cropping program at the Irrigation Research and Extension Committee (IREC) Field Station. Key learnings from this season were, green manure crops are easy to establish and provide benefits to following crops and will be used again. Planting mung beans into standing stubble was not a success. Cotton was the standout summer crop for the 20-21 season and good variety selection and management are vital for quality. The research found it is difficult to overcome the impact of variable fertilizer application from previous crops and top-dressing rice at the correct time is critical. An additional 20 ha of land is currently under development to expand the pipe through the bank (PTB) layout. This will enable IREC to demonstrate a wider range of automation equipment and sensors in the 2021/22 season. IREC have found at their site that the bankless channel system has improved water efficiency compared to the pipe-through-the bank (PTB).

Southern Growers:

At the Southern Growers (SG) site all the winter crops in the 2020 season were irrigated fully in spring and harvested for grain with good yields achieved. Irrigating and pushing for high yields did however increase the growing season and delayed the rice sowing to outside its ideal sowing window, inadvertently pushing rice into a cold temperature at the critical flowering periods. The 2020/21 season temperatures were below average which had a very negative impact on the rice at SG. The long season Reziq only averaged 2.8 t/ha down from the 5-year industry average in the area of 9.9 t/ha, the Viand (sown after the winter crop) averaged 0.7 t/ha from an industry average of 9.6 t/ha. This approach of a continual double cropping system is proving to be very risky and in the 2020/21 season resulted in large economic losses. Another consequence of this system is that due to the delay in rice maturity (due to time of sowing) SG have been unable to sow the subsequent winter crop. For the 2021/22 rice season automation will be installed at the site, and SG aim to showcase this with delayed permanent water in the rice phase. Due to no winter crop the focus will be on sowing early to ensure that winter crops can be sown. Water on and off each bay will be measured as well as soil moisture in each treatment.

Irrigated Cropping Council:

In the 2021 winter cropping season the Irrigated Cropping Council (ICC) aim to highlight the importance of avoiding drought stress / waterlogging at key growth stages and how knowledge of available soil moisture can improve scheduling. In 2020, despite the site suffering significant moisture stress prior to the start of the irrigation season, the demonstration showed large differences in water use efficiencies and gross margins. It highlighted the importance of pre-irrigation on the demonstration soil type as the site had run out of moisture well before the season opening despite sowing into a full moisture profile. An article of results can be found at <https://irrigatedcroppingcouncil.com.au/wp-content/uploads/2021/04/SIP2-Project-Results-2020.pdf>. An economic case study of the work from the 2019 season is available at: [Winter-cropping-irrigation-scenarios-Nth-Vic.pdf](#)

For more information visit the [Smarter Irrigation for Profit](#) website and watch the videos or listen to the podcast: at

- Farmer experiences- Double Cropping in a Rice System. Available at: <https://smarterirrigation.com.au/double-cropping-in-a-rice-system/>
- <https://smarterirrigation.com.au/alex-schultz-from-nsw-dpi-talks-about-the-smarter-irrigation-for-profit-phase-2-key-learning-sites-in-southern-nsw/>
- <https://smarterirrigation.com.au/how-do-we-use-data-to-make-irrigation-decisions/>
- <https://smarterirrigation.com.au/murray-valley-soil-moisture-monitoring/>

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