Smarter Irrigation for Profit PHASE II

ABOUT PROJECT

Smarter Irrigation for Profit Phase 2 (SIP2) is a partnership between the irrigation industries of sugar, cotton, grains, dairy and rice, research organisations and farmer groups. The objective of SIP2 is to improve the profit of over 4,000 irrigators. It has 14 sub-projects covering three main components:

- Development of new irrigation technologies including new sensors, advanced analytics to improve irrigation scheduling and strategies to reduce water storage evaporation.
- Cost effective, practical automated irrigation systems for cotton, rice, sugar and dairy.
- Closing the irrigation productivity yield gap for cotton, rice, dairy, sugar and grains irrigators through a network of 46 farmer led optimised irrigation sites and key learning sites located on commercial farms across Australia.

Visit Project Website

Irrigated Cropping Council
Promoting irrigated agriculture

2020 ICC DEMONSTRATION

This demonstration aims to maximise profitability in low allocation / high-water price years by reducing the number of irrigations. We will highlight key growth stages to avoid drought stress in wheat and show how soil moisture monitoring can improve scheduling.

The 2020 trial was sown into almost ideal conditions with the block receiving 198mm in the four months prior to sowing – more than for the entire of 2019. The tap then turned off with us getting 27.2mm in May (decile 5), 16.5mm in June (decile 2) and just 10.4mm in July (decile 1). Soil moisture probes indicated that if we were able, we should have irrigated in mid-July. We have received 29mm rainfall in the first 10 days of August which perked up the crop. Despite this, soil moisture monitoring showed that water only infiltrated to 20cm so irrigation early in the season will play a vital role in maintaining yield potential.

Treatments reflect the dry conditions at the site. The entire block received 1ML/ha when the season opened and the treatments will be:
- 1 spring irrigation (opening only),
- 2 spring irrigation (opening + GS47),
- 2 spring irrigations (opening + GS61),
- 2 spring irrigations (opening + one based on soil moisture),
- 3 spring irrigations (opening, GS47 + GS61) and,
- fully irrigated based on soil moisture.

Murray Valley Soil Sensor Network - visit site to see Kerang soil moisture details

Australian Government
Department of Agriculture, Water and the Environment

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2019 TRIAL RESULTS

Despite the rain in early May, establishment was patchy in the no pre-irrigation plots with a secondary germination occurring later in May. Dry matter cuts comparing pre-irrigated and 'no pre-irrigation' Beckom plots demonstrated the greater vigour with 0.79 t DM/ha and 0.16 t DM/ha respectively, 52 days post sowing. Varieties did respond to the season differently, the short season Axe in the no pre-irrigation treatments quickly started the stem elongation phase with heads emerged by August 22nd, just prior to irrigation. Therefore, yield potential was set so irrigation could only improve grain size or begin secondary tillering, which would then require more than 1 irrigation to finish properly.

Table 1: Wheat yield and quality results as an average of all six varieties

Wheat	Yield (t/ha)	Protein (%)	Screen (%)	est Wt (kg/hl
No pre + 1 spring	3.62	8.9	2.8	78.6
No pre + Full spring	5.00	10.3	1.8	74.9
Pre-irrigation + 1 spring	4.95	9.8	1.5	79.1
Pre-irrigation + Full spring	6.15	12.1	1.8	80.3

WHAT WERE THE RESULTS IN 2019?

Table 2: Best performing varieties based on irrigation strategy

Treatment	Variety	Maturity
No pre + 1 spring	DS Bennett	Late
No pre + Full spring	DS Bennett	Late
Pre-irrigation + 1 spring	Beckom	Mid
Pre-irrigation + Full spring	Cobra	Early-mid

Table 3: Gross margin for the average of the 6 wheat varieties. Input costs (excluding water and urea) used in the calculation were $318/ha

	Irrigation (Ml)			Water = $60		Water = $500/750	
Wheat ASW @$329/t	Pre-irrigation	Spring	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	0	1.5	3.62	$780	$520	-$255	-$170
No pre-irrigation + full spring	0	3.4	5.00	$1,105	$381	-$897	-$308
Pre-irrigation + 1 spring	1.75	1.0	4.95	$1,075	$391	-$385	-$140
Pre-irrigation + full spring	1.75	2.9	6.15	$1,255	$270	-$1,516	-$326

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Tables 4-9: Gross
margins for each variety included in the trial. These comparisons are based on simply highlighting the highest figures rather than from a statistical analysis. For example, the difference between returns in DS Bennet are in the vicinity of $339/ha or $110/Ml before treatment gross margins can be regarded as significantly different

		Water = $60		Water = $500/750	
Axe	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	2.82	$517	$345	-$518	-$345
No pre-irrigation + full spring	3.82	$733	$253	-$1,268	-$437
Pre-irrigation + 1 spring	3.53	$509	$110	-$2,262	-$486
Pre-irrigation + full spring	4.72	$775	$167	-$1,996	-$429

		Water = $60		Water = $500/750	
Beckom	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	3.95	$888	$592	-$147	-$98
No pre-irrigation + full spring	5.43	$1,246	$429	-$755	-$261
Pre-irrigation + 1 spring	6.33	$1,528	$556	$68	$25
Pre-irrigation + full spring	6.86	$1,494	$321	-$1,277	-$275

		Water = $60		Water = $500/750	
Cobra	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	3.58	$767	$511	-$268	-$179
No pre-irrigation + full spring	4.94	$1,105	$381	-$896	-$309
Pre-irrigation + 1 spring	5.59	$1,285	$467	-$175	-$64
Pre-irrigation + full spring	8.31	$1,981	$426	-$790	-$170

		Water = $60		Water = $500/750	
DS Bennett	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	4.07	$927	$618	-$108	-$72
No pre-irrigation + full spring	6.20	$1,498	$517	-$503	-$173
Pre-irrigation + 1 spring	4.77	$1,016	$369	-$444	-$161
Pre-irrigation + full spring	5.13	$892	$192	-$1,879	-$404

		Water = $60		Water = $500/750	
Scepter	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	3.69	$803	$535	-$232	-$155
No pre-irrigation + full spring	4.67	$996	$344	-$1,005	-$346
Pre-irrigation + 1 spring	3.57	$622	$226	-$838	-$305
Pre-irrigation + full spring	4.86	$822	$177	-$1,949	-$419

		Water = $60		Water = $500/750	
Trojan	Yield (t/ha)	$/ha	$/Ml	$/ha	$/Ml
No pre-irrigation + 1 spring	3.86	$767	$511	-$268	-$179
No pre-irrigation + full spring	4.94	$1,085	$374	-$916	-$316
Pre-irrigation + 1 spring	5.91	$1,390	$505	-$70	-$25
Pre-irrigation + full spring	7.03	$1,551	$334	-$1,220	-$262

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