

AUTOMATION OF FURROW IRRIGATION

RUSSELL JORDAN

Site details

- **LOCATION:** Black Road, Upper Houghton
- Five irrigation sets automated, covering approximately 82 hectares
- This farm is representative of a typical BRIA farm. There are no pumps with all the water being delivered under gravity from the SunWater channel. There is also no tail water recycling and one of the challenges is to manage the system to ensure effective irrigation while minimising run-off.

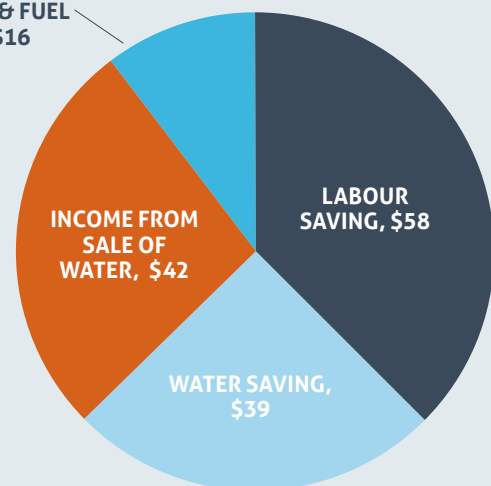


COST BENEFIT SUMMARY	
Area automated	82 hectares
Total cost	\$ 49,700
Life span (minimum expected)	7 years
ANNUAL COSTS AND BENEFITS (\$/HA)	
System cost	\$ 87
Labour Saving	\$ 58
Electricity tariff saving	\$ 0
Water Saving	\$ 39
Income from sale of water	\$ 42
Vehicle R, M & fuel saving	\$ 16
Pumping cost saving	\$ 0
Sum of benefits	\$ 155
Benefit - Cost	\$ 68

Costs associated with borrowing money have not been factored into this analysis

ANNUAL PER HECTARE SAVINGS

VEHICLE R, M & FUEL
SAVING, \$16



ANNUAL COST: \$87/HA
ANNUAL BENEFIT: \$155/HA

For Russell Jordan the greatest economic benefit from the automation has been the water savings that he has achieved. The automation has made it possible to almost eliminate run-off and this has resulted in a water saving of three hours per irrigation or 1.36 ML/ha. This not only provides a cost saving through reduced water purchases, but also provides him with the opportunity to sell excess water under temporary transfer.

This farm represents the largest area under automation (82 ha), and it is the only site that has no pumping costs as all the irrigation water is supplied under gravity from the SunWater channel. While the water saving in this case has no corresponding pumping saving, a similar reduction in water use on his other farms would also save Russell energy costs.

The other major cost saving for Russell is in time and labour that is required to monitor the irrigations. Each visit to check on the irrigation progress would take approximately 30 minutes and a 25 km round trip from his home farm. Russell's confidence in the automation system means he no longer visits the farm just to check on the irrigation progress, he allows the system to switch from one set to the next or to stop irrigating. In fact, he says he now spends more time checking the one block on this farm that isn't automated than he does on the rest of the blocks put together.

A less quantifiable benefit of the automation is the impact on water quality. Because this farm has no recycling system any run-off is lost to the environment. To prevent this

the automation has been configured to minimise run-off by changing or stopping the irrigation 1-2 hours before water reaches the end of the block. This point has been carefully calibrated to ensure that the irrigation reaches the end of the field, so productivity is not affected, but also so that there is no or only minimal run-off.

With the purchase of this farm Russell found himself on the borderline of being able to manage all the farming activities by himself. The automation allows him to spend more time on other farming activities and less on monitoring irrigation. It also means that he can continue to run the farm by himself and avoid the costs associated with hiring farm staff.

BREAKDOWN OF BENEFITS (\$/YEAR):**No of irrigations per year—80**

- 5 blocks x 16 events = 80

Vehicle costs—\$1,290

- 80 events x 2 trips/event x 25.2 km/trip = 4,032 km/yr
- R, M & fuel cost : 4,032 km @ 32 c/km = \$1,290

Labour saving— \$4,737

- 80 events x 2 trips/event x 25 min/visit = 66.7 hr
- 66.7 hr x \$30/hr = 2,000
- Travel time: 4032 km @ 44 km/hr = 91.2 hr
- 91.2 hr x \$30/hr = \$2,737

Water saving—\$3,199

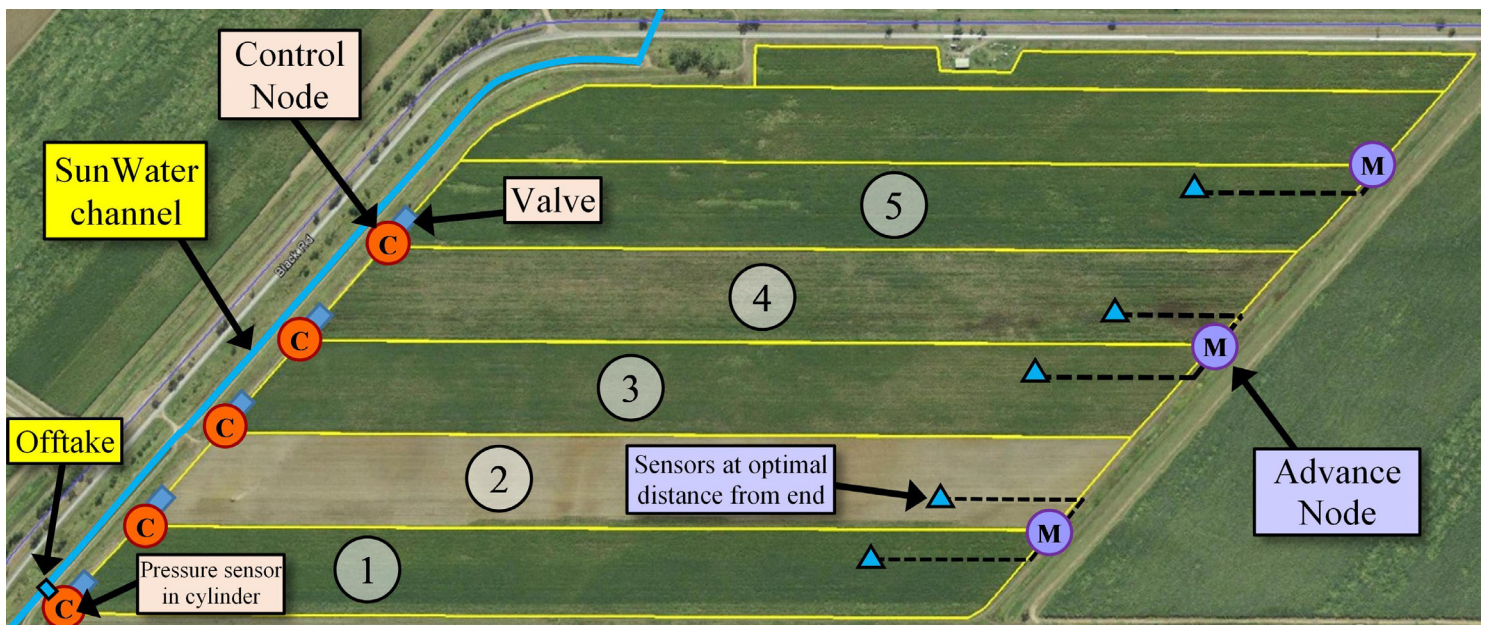
- 80 events x 3 hr/event @ 129 L/s = 111.5 ML
- 111.5 ML x \$28.70 = \$3,199

Income from sale of excess water—\$3,428

- 111.5 ML x \$30.76/ML = \$3,428

INFRASTRUCTURE INSTALLED:

- 1 base station, computer and software
- 5 actuator control radios, one per outlet
- 5 actuators and brackets; all the outlets on this farm only have one valve
- 1 pressure transducer (inside cylinder)
- 3 advance detection (end of field) radios
- 5 advance sensors (positioned within field)

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