

HIGH PERFORMANCE AUTOMATED FURROW IRRIGATION

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Issues being addressed?

Furrow irrigation is the most popular irrigation method in cotton. However, two issues: low efficiency and huge labour involvement concern irrigators due to scarcity in recent years. To address these issues, NCEA and Rubicon Water, Australia are developing a commercial prototype smart furrow irrigation system. The system has shown that both issues disappear with adoption of real-time optimisation and automated furrow irrigation.

Key results and findings?

Automated furrow irrigation

Figure 1 represents the automated furrow irrigation system developed integrating real-time irrigation

optimisation with Rubicon's surface irrigation automation hardware and software. This system is able to adapt the control strategy in real time to the changing field conditions. This relies on measurement of key data such as inflow rate and the speed of water advance.

Findings

The automated furrow irrigation system (Figure 2) was evaluated over the 2013/14 cotton season and was found to work reliably without manual intervention. The preliminary results indicate that higher irrigation application efficiency (up to 90%) is achievable along with significant labour saving.



FIGURE 2. Automated system in operation.

Impact on the Australian cotton industry?

Fully tested commercial adaptive real-time furrow irrigation system would be available to compete with the pressurised alternative of centre pivot or lateral move machines on capital cost, water and labour savings but without the massive energy costs.



FIGURE 1. Automated furrow irrigation tested in field.