

Controlling surface irrigation using digital devices

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Abstract

Furrow irrigation is widely used and is the most popular irrigation method for row crops. In Australia this method is widely used (about 95%) for the irrigation of cotton, although it is labour intensive and traditionally has had low water use efficiency due to the significant amount of water losses through deep drainage and runoff. However, it is reported that a well-designed and managed furrow irrigation system may have application efficiencies up to 90% to 95% that would be similar to other more energy intensive efficient irrigation systems. Towards this, the National Centre for Engineering in Agriculture (NCEA) has been playing the leading role in the world since a long period of time and made a significant improvement in efficient furrow irrigation. Recent research at NCEA has established the foundation for the real-time control of furrow irrigation. It has developed the concept and tested the software required for the real-time optimisation and has shown its capability of sensing the inflow and advance, simulating the irrigation, and predicting the optimum time to cut-off without any user intervention. In partnership with technology company Rubicon Water, the NCEA has developed a smart automation system for controlling furrow irrigation using internet connected latest digital devices like smart phones, iPad, laptop or desktop from anywhere in the world. It involves flow control infrastructure, advance sensors, control software and wireless communications. Currently the NCEA is demonstrating this system in various locations in cotton growing region across Australia through a project funded by the Cotton Research and Development Corporation. The preliminary results show the potential of the system to save significant labour and water although there remain some limitations in water delivery system.