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TI: WaterWorks: A Decision Support Tool for Irrigation Infrastructure Decisions at Farm Level

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AB: Increasing water scarcity, climate change and pressure to provide water for environmental flows urge irrigators to be more efficient. In Australia, ongoing water reforms and most recent National Water Security Plan offer incentives to irrigators to adjust their farming practices by adopting water saving irrigation infrastructures to match with soils, crop and climatic conditions. WaterWorks is a decision support tool to facilitate irrigators to make long and short term irrigation infrastructure investment decision at the farm level. It assists irrigators to improve the economic efficiency, water use efficiency and environmental performance of their farm businesses. The WaterWorks has been tested, validated and accepted by the irrigation community and reachers in NSW. The interface of WaterWorks is user-friendly and flexible. The simulation and optimisation module in WaterWorks provides an opportunity to evaluate infrastructure investment decisions to suit their seasonal or long-term water availability. The sensitivity analysis allows substantiating the impact of major variables. Net present value, internal rate of return, benefit cost ratio and payback period are used to analyse the costs and benefits of modern irrigation technology. Application of WaterWorks using a whole farm-level case study indicates its effectiveness in making long term and short term investment decisions. The WaterWorks can be easily integrated into commercial software such as spreadsheets, GIS, real time data acquisition and control systems to further enhance its usability. The WaterWorks can also be used in regional development planning. Keywords: Decision support tool; Water Management; Seasonal and long term investment; Optimisation; Simulation; Benefit-cost analysis; Whole farm; Water trading; Water saving.

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