



# FINAL REPORT

*(due within 3 months on completion of project)*

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## *Part 1 - Summary Details*

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**Cotton CRC Project Number:** 5.01.05

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**Project Title:** Rural Water Use Efficiency 3: Best Practice Water Use and Irrigation in Irrigated Cotton and Grain

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**Project Commencement Date:** 1 July 2006 **Project Completion Date:** 30 June 2009

**Cotton CRC Program:** Adoption

## *Part 2 – Contact Details*

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## ***Part 3 – Final Report Guide (due within 3 months on completion of project)***

### ***Background***

Irrigated cotton and grain growers can achieve substantial improvements in water use efficiency by implementing best management strategies identified in the RWUE Cotton and Grains projects (Rural Water Use Efficiency Initiative and Rural Water Use Efficiency 2) and in other industry research and development projects. Irrigators in most regions will experience reduced water allocations in the near future as management plans are implemented to share water resources in the Murray Darling and Fitzroy River basins. Improved WUE provides irrigators with the capacity to maintain production with reduced water allocation. The critical environmental benefits to be derived from improved WUE are the avoidance of deep drainage and salinity and the prevention of contaminated tailwater flowing into rivers and streams.

The Rural Water Use Efficiency Initiative ran from July 1999 to June 2003. The key achievements were:

- Greater than 75% awareness and participation in the program
- Cotton and grain irrigators investment of \$3.6 million with a government contribution of \$1.5 million
- 78% of cotton irrigators had become involved in Cotton BMP by August 2001
- A 12.8% increase in water use efficiency (equivalent to ~ 60 000 ML). An increase in GPWUI ranged from 45% to 55% and the change in IWUI ranged from – 11% to 30% shown below when compared to the baseline for WUE in the Australian Cotton Industry was determined by Tennakoon and Milroy (2003).

**Table 1** Average WUE indices (bales/ML) for Queensland during RWUEI

District	GPWUI	% change	IWUI	% change
Border Rivers	1.18	55%	1.51	11%
Central Queensland	1.18	46%	1.42	-11%
Darling Downs	1.33	45%	2.22	30%

The RWUEI final report recommended a continuation of funding for the project to build on its achievements.

The Rural Water Use Efficiency 2 Project (July 2003 to June 2006) preceded the RWUE3 project. This project continued to build on the skills developed within RWUEI. It also leveraged off the successful incentives program in RWUEI that built interest in the adoption of improved irrigation practices.

RWUE2 succeeded in:

- Building on the extension knowledge and models established in RWUEI
- Further encouraging practices change amongst irrigators under the banner of the cotton industry's BMP program

- Establishing links with the private sector to encourage the provision of high-end water use efficiency services
- Started to draw the links between catchment management objectives and on-farm practices

The RWUE2 final report recommended further investment to establish the monitoring systems and support network, and relevant business capacity, to support the linkages between on farm investments in water use efficiency technologies, catchment management objectives and sustainable water use.

The RWUE3 Best Practice Water Use and Irrigation in Irrigated Cotton and Grain project followed on from the RWUE1 and RWUE2 projects.

### ***Objectives***

The objectives of the RWUE3 project were:

- Industry with increased use of whole farm Water Use Efficient (WUE) practices; efficient use of available water resulting in an increased production per ML
- Industry able to demonstrate environmental credentials
- Improvements in on farm WUE have been documented with a target of 15% improvement in WUE by growers participating in RWUE
- 15% of irrigators achieving Irrigated Water Use Indices of 2 bales/ML

### ***Methods***

The key activities undertaken to meet the objectives for the project were:

- Develop and deliver technical irrigation communication
- Established demonstration sites regionally
- Establish benchmarking tools and industry data
- Develop and deliver training workshops
- Perform and promote irrigation system evaluations
- Develop and deliver technical irrigation presentations
- Promote and provide technical support to the cotton industry's BMP and NRM bodies regional priorities

### ***Results***

Table 2 summarises the achievements of the RWUE3 project against the targets set at the commencement of the project.

#### ***Key Achievements - Communication***

Information related to irrigation best practice was distributed to all growers (325 individuals) and consultants (113 individuals) within the cotton industry during the course of RWUE3. The communication channels used included:

- CottonTales Newsletter

- The Australian Cottongrower Magazine
- The Australian Grain Magazine
- Irrigation Australia Journal
- The Australian Cotton Conference Proceedings
- “More Profit Per Drop” e-newsletter
- Cotton and Grains Irrigation Website
- Regional Trial books
- “Darling Downs Waterchat”
- The CRDC Spotlight on R&D

There have been 69 separate articles and 56 promotional items published in 87 issues of the various communication channels. The number of recipients of the communication channels ranges from 121 to 5190 recipients.

A significant number of grain irrigators and consultants within the target districts also received this information. This information included 13 cases studies (exceeding the 12 required as part of the project).

### ***Key Achievements - Demonstration Sites***

The RWUE3 team directly established 21 demonstration sites (exceeding the target of 12 sites) and were involved with 15 other sites established by consultants as part of the Consultant Mentoring project funded by Condamine Alliance.

These demonstration sites directly involved:

- 189 growers (58% of cotton irrigators)
- 29 consultants (26% of cotton consultants)

The 58% of growers directly involved in these demonstration sites falls short of the target of 75% of producers directly involved in RWUE3 activities. This was in part due to the impact of low water availability on morale during RWUE3. This reduced their willingness to participate. However, the low water availability has meant all irrigators have changed or are looking at changing their management practices and/or irrigation systems in response to this (exceeding the target of 70% of growers in each region have started to make these changes).

No irrigator tours were conducted during RWUE3 (failing to meet the target of 6 irrigator tours). There was no interest in such tours by irrigators when approached during RWUE3 – primarily due to limited water availability and low irrigator morale.

There were 77 irrigation evaluations undertaken at these sites with 17 articles, 5 field days and 3 presentations resulting from this work.

The participatory action learning model employed through the demonstration sites resulted in all in co-operators measuring irrigation practices and implementing practice change on farm. The engagement with consultants was particularly valuable in developing their capacity to deliver irrigation services to their broader client base.

**Table 2** Summary of RWUE3 achievements against targets

<b>RWUE3 Targets</b>	<b>Achievements</b>	<b>Explanations</b>
<b>ACTIVITIES</b>		
<b>Communication</b>		
95% (cumulative) of industry enterprises in the target districts have received information about improving water use efficiency.	69 separate articles 56 promotional items 121 to 5190 recipients – 100% of enterprises reached	
12 (cumulative) Case Studies developed and promoted through industry sources.	13 case studies communicated	
<b>Demonstration Sites</b>		
12 (cumulative) on-farm demonstration sites established	21 direct sites 15 indirectly	
6 irrigator tours (cumulative) conducted	8 (demo walks, farm walks and field days)	
<b>Benchmarking</b>		
65% of irrigators benchmarking their irrigation activities and adopting water use best practice	Benchmarking Workshop undertaken by 11% of growers and 16% of consultants. 80% indicated they would use benchmarking in future	Broader extent of benchmarking use unknown – release of myBMP will address this.
<b>System Evaluations</b>		
6 full irrigation system audits conducted	39 overhead systems 77 furrow evaluations	Furrow evaluations still to be entered into ISID
<b>Training</b>		
35 (cumulative) FMS workshops provided that provide advice on irrigation / water use best practice	29 training workshops 10 presentations	
50% of consultants and 40% of irrigators participating in formal WUE training activities	65% of consultants and 29% of growers	

RWUE3 Targets	Achievements	Explanations
<b>Presentations</b>		
No specific targets set	10 presentations to audiences of 16 to 300	
<b>BMP</b>		
Relationship between electronic version of BMP and WUE on farm tools determined	WUE Benchmarking Tool developed for use with electronic BMP	myBMP still to be released
Developing on-farm tools that interact with electronic Cotton BMP	ISID developed Data entered into IPART WUE Benchmarking tool developed	myBMP still to be released
<b>NRM</b>		
Report against on-farm achievement of regional NRM priority activities, defined with regional NRM groups	Worked directly with 103 irrigators to access \$1,285m in funding through four NRM Bodies aimed at achieving improved WUE on-farm	
<b>OUTPUTS</b>		
<b>Participation</b>		
75% (cumulative) of producers have been directly involved in RWUE3 activities	Demo Sites - 58% growers and 26% consultants involved System checks - 34 growers involved Training Workshops - 29% growers and 65% consultants involved	Participation less than target due to the impact of low water availability on morale
<b>USAGE</b>		
70% of growers in each region have started to make changes in management practices and/or improved equipment and/or improved operations in relation to water management		No independent statistics available verify subjective observation that this target has been met

RWUE3 Targets	Achievements	Explanations
<b>OUTCOMES</b>		
Industry with increased use of whole farm Water Use Efficient (WUE) practices; efficient use of available water resulting in an increased production per ML	Available ABS Statistics suggest an improvement in IWUI of 59% from 2002-03 to 2007-08 – a result of adoption of more efficient irrigation practices and improved yields	
Industry able to demonstrate environmental credentials		Awaiting roll-out of myBMP – this will provide necessary data to demonstrate environmental credentials
Improvements in on farm WUE have been documented with a target of 15% improvement in WUE by growers participating in RWUE	Benchmark data needed to demonstrate this	Awaiting myBMP rollout and follow-up WaterTrack Rapid survey
15% of irrigators achieving Irrigated Water Use Indices of 2 bales/ML	Available statistics show an IWUI of 1.84 bales/ML in 2007-08. IWUI values > 2 bales/ML only recorded from drip irrigated sites. WaterTrack Rapid data suggests that a more realistic target for GPWUI is 1.39 bales/ML	Measurement of this target only possible with rollout of myBMP

### ***Key Achievements - Benchmarking***

Significant effort was put into the development of benchmarking tools and training in their use. The review of WUE benchmarks in the Australian Cotton Industry identified the inconsistencies of past benchmarking data collected and highlighted the value of the benchmarking tools developed in collaboration with RWUE3. Firstly in standardising the water use indices reported, and secondly, promoting a number of tools available to irrigators to benchmark their water use on-farm.

The Watertrack Rapid™ survey demonstrated that WUE data could be collected in a short amount of time to provide a snapshot of the industry’s performance. Thirty-six farms from Emerald to Hillston were benchmarked using the commercial WaterTrack Rapid™ averaging a GPWUI of 1.13 bales/ML where the top 20% of irrigators achieved a GPWUI 1.26 bales/ML.

There have been 59 participants in the Irrigation Benchmarking and Water Budgeting workshop (35 growers, 18 consultants and 6 others – this represents 11% of growers and 16% of consultants) to date. Evaluation of participants has indicated that training will be the best tool to provide growers with the confidence to benchmark water use on farm. The evaluation showed that all participants increased knowledge of the benchmarking process and between 75 – 80% of participants planned to implement some form of benchmarking on farm.

IPART and ISID benchmarking tools highlight the value of benchmarking irrigation system performance and demonstrated the need for further training and awareness of both overhead system evaluation and furrow irrigation evaluation to improve irrigation performance of individual systems.

The benchmark data from the demonstration sites established is presented in Table 3.

**Table 3** Cotton benchmark data for the RWUE3 demonstration sites

<b>Gross Production Water Use Index (bales/ML)</b>				
<b>System</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Surface	0.58 to 1.08	1.33 to 1.66		
Overhead	1.28	1.05 to 1.31		
Drip			0.9 to 1.1	1.20 to 1.30
<b>Irrigation Water Use Index (bales/ML)</b>				
<b>System</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>
Surface		1.29 to 1.78		
Overhead				
Drip			2.3 to 2.6	2.7 to 2.9

Implementation of the myBMP will significantly enhance the uptake of benchmarking within the industry and provide good data on the irrigation benchmarks being achieved.

### ***Key Achievements - Training Workshops***

RWUE3 staff, in collaboration with the National Program for Sustainable Irrigation funded project: Knowledge Management in Irrigated Cotton and Grains Project, participated in the development of the Cotton and Grains Workshop Series. The workshops in this series are mapped against national training competencies so that participants could contribute

towards obtaining a nationally recognised qualification. The seven workshops developed are:

1. Irrigation Benchmarking & Water Budgeting
2. Scheduling I
3. Scheduling II
4. Storage and Distribution Systems
5. Pumps
6. Surface Irrigation Performance Evaluation
7. Flow Metering

In addition, RWUE3 staff are developing an overhead irrigation evaluation awareness workshop. The pilot for this workshop is planned for mid-June 2009.

RWUE3 staff delivered 27 workshops to 202 participants (29% of growers and 65% of consultants). Evaluation of the workshop participants indicated significant increase in knowledge and skills, and a willingness to implement this new knowledge in the irrigation management practices.

### ***Key Achievements - Irrigation System Evaluations***

RWUE3 in collaboration with NCEA developed the Irrimate Surface Irrigation Database (ISID) and provided feedback on the development of the Irrigation Performance and Reporting Tool (IPART). Currently there are 100 furrow system evaluations from Queensland reported in ISID. The RWUE3 project has contributed a number of these current evaluations into ISID and is intending to contribute a significant number from the previous RWUE programs and those collected during RWUE3 (77 in total). The results of the 100 measured evaluations indicate an average application efficiency of 65%, with an application of 121mm resulting in deep drainage losses of 22mm and runoff of 26mm. Optimisation results in a reduced average application depth of 98mm (with average deep drainage losses reduced to 15mm and runoff reduced to 7mm) and an increased application efficiency to 81%.

There have been 46 overhead irrigation system evaluations conducted during the RWUE programs (39 of these during RWUE3). This is significantly more than the original target of six audits. The data collected indicate that only 9% of machines tested demonstrated excellent co-efficient of uniformity figures, and that 48% had poor to fair co-efficient of uniformities. These figures demonstrate the need for further extension effort to train irrigators in the importance of having overhead system evaluations conducted on existing machines and included as part of the commissioning of new machines. As a result the RWUE3 team are currently developing an overhead system evaluation awareness training workshop for the industry.

### ***Key Achievements - Presentations***

RWUE3 presented 10 Technical Irrigation Presentations to audiences ranging from 16 to 300. This included not only cotton and grain irrigators and their consultants, but also potential new irrigators in the Queensland Gulf.

### ***Key Achievements - BMP***

The RWUE3 team have provided technical support to Cotton BMP and have developed an Irrigation Benchmarking tool to support the implementation of the Cotton BMP Land and Water module. They also collaborated with the NCEA in the development of the ISID and IPART benchmarking tools. The RWUE3 team have aligned training activities including the

Irrigation Benchmarking and Water Budgeting workshop along with all workshops and demonstrations to promote best practice to support the implementation of the BMP program on farm. The Cotton BMP has been under re-development throughout RWUE3 and will be released as the new myBMP later in 2009.

RWUE3 provided technical support to 20 cotton irrigators involved in BMP L&W modules. To date there are 17 cotton irrigators certified to the cotton industry's BMP Land and Water Management module.

### ***Key Achievements - NRM bodies***

The RWUE3 staff worked closely with their respective NRM Groups to implement incentive schemes which enhance the adoption of more water use efficient practices. These regional bodies have been:

- Border Rivers - QMDC and Border Rivers-Gwydir
- Darling Downs - Condamine Alliance
- Central Queensland - CHRRUP

RWUE3 worked directly with 103 irrigators to access \$1,285m in funding to implement best irrigation practices on farm.

### ***Outcomes***

The Cotton Catchment Communities CRC outcomes addressed by this project have been:

- Internationally competitive cotton farming systems with improved profitability and sustainability of production
- Best practice cotton enterprises delivering sustainable ecosystems and reduced impacts on catchments
- Increased adoption of new knowledge and enhanced decision making capability of people working in or with the cotton industry, its catchment and communities

The outputs of this project leading to these outcomes have been:

- production of a range of communication materials that have been read by growers and consultants (received by just under 8000 cotton and grain irrigators and industry recipients)
- establishment of 36 demonstration sites used as the basis of a range of field days and communication materials. These demonstration sites resulted in the participation of 189 growers and 29 consultants.
- benchmarking of irrigation performance in the cotton industry through a review of Australian and international statistics and research, WaterTrack Rapid survey, demonstration sites and overhead system evaluations. The outputs from these have provided a measure of the progress the industry has made towards improving water use efficiency with a 50% increase in cotton yield per megalitre of water supplied to farms

- the development and delivery of specialist irrigation training workshops delivered to 95 growers, 74 consultants and 22 others within Queensland.

The detail of activities, outputs and outcomes achieved by this project are summarised in the attached Appendix 1 – Final Report: Rural Water Use Efficiency 3 – Best practice water use and irrigation in irrigated cotton and grain.

### ***Conclusion***

The RWUE3 team have successfully provided the cotton and grain irrigators with the necessary knowledge and skills to adopt and implement irrigation best practice on farm. This has in turn led to more efficient irrigation practices reflected in increased production per ML. The use of irrigation best management practices has enabled cotton and grain irrigators demonstrate their environmental credentials – something that will be further enhanced by the release and implementation of myBMP. This will also enable improved documentation of the extent of best practices within the industry.

The RWUE3 team have continued to support the industry in achieving continued improvements in WUE. This is reflected in the 27 per cent improvement in IWUI within Queensland from 2002-03 to 2006-07 (see Table 4). Data from the demonstration sites during RWUE3 show the significant improvements being obtained as a direct result of adopting irrigation best management practices promoted by RWUE3 staff – significant improvements in both GPWUI and IWUI are reported.

Current industry performance is GPWUI = 1.13 bales/ML and IWUI = 1.58 bales/ML. Therefore the target of 15% of irrigators achieving an IWUI of 2 bales/ML remains aspirational. Achievement of a IWUI target of 2 bales/ML is only possible where irrigators have made significant investments in new irrigation infrastructure (as demonstrated by the IWUI values achieved for drip and overhead system irrigation in the RWUE3 demonstration sites, and by commercial irrigators using these systems). For surface irrigation systems a more realistic target of GPWUI = 1.39 bales/ML and IWUI = 1.5 bales/ML should be set. This appears achievable based on our current knowledge. It should also be remembered that there is significant variability in the IWUI figure driven by the seasonal conditions experienced from year to year. Other measures should also be considered – particularly those related to achieving the highest possible application efficiencies for all irrigation systems being used.

### ***Recommendations***

- Use of Participatory Action Learning Model by regional irrigation extension officers to implement practice change on farm through the benchmarking of current irrigation system performance
- Implement an ongoing, coordinated communication effort to keep current and accurate technical irrigation information (including costs: benefits and information on practices) readily available

- Continue promotion and training in the use of available benchmarking tools developed under RWUE3
- Continue evaluation of overhead irrigation systems as a priority. This requires:
  - Promotion of the need for these for existing and new CPLMs to irrigators
  - Engagement with commercial suppliers of CPLMs
  - Collaboration with the two existing engineering consultants who can provide this service.
- On going delivery of training workshops post RWUE3 will be critical to the success of the irrigation industry in implementing best practice on farm. Given the difficulty with attracting participants in some districts we believe new technologies should be investigated as a delivery mechanism i.e. webinars
- More R&D on the agronomics of irrigated crops would aid in the extension of best management irrigation practices across industries. Information on the economics of these needs to be generated and extended also.

### ***Publications***

Brotherton, E. (2008) Why should you evaluate your surface system? A case study in the Border Rivers. *Australian Cottongrower* 29(1):21-22

Brotherton, E, Harris, G, Smith, P, and Wigginton, D. (2008) Deep drainage myth-busters, *Australian Cottongrower* 29(4): 38-43

Carrigan, E and Hood, S. (2006), 'Siphonless Irrigation Project' 13th Australian Cotton Conference Proceedings 2006

Carrigan, E. (2007) District Report Macintyre Valley, *Australian Cottongrower* 28(1): 62-63

Carrigan, E., Harris, G. and Hood, S. (2007) The challenge of a new lateral move or centre pivot, *Australian Cottongrower* 28(1):16-20

Carrigan, E. Harris, G. and Hood, S. (2007) So, your buying a new lateral or pivot?, *Australian Grain* 16(6)Northern Focus 7-8.

Hare, J. (2008), 'Using ET to estimate water use', *The Australian Cottongrower* 29(6): 39-42

Hare, J. (2008), 'Assessing the impact of irrigation management on Bollgard® varieties through on-farm trialling (2006/2007 Season)' 14th Australian Cotton Conference Proceedings 2008

Hare, J. and Harris, G.A (2008) Leaky storages – What are the options? *Australian Cottongrower* 29(2):34-38

Hare, J. and Harris, G.A. (2008) Leaky storages – What are the options? *Australian Grain* 17(7):40-42

Hare, J. and White, S. (2008) Variety and irrigation strategy: results from a Darling Downs trial. *Australian Cottongrower* 28(7):22-25

Harris, G.A. (2006) Cotton and Grain Water Team Update, *Australian Cottongrower* 27(6):12-13

Harris, G. (2007) Furrow evaluation improves irrigation efficiency, Australian Cottongrower 27(7):28-33

Harris, G. (2008), 'Cotton CRC given green light for on-farm storages project', The Australian Cottongrower 29(4): 45

Harris, G. (2008) Irrigation Research, Drip irrigated cotton demonstrations on the Darling Downs, Irrigation Australia Journal 24(3): 27-30

Harris, G.A. (2008) Overhead irrigation: profitable or not? Spotlight on Cotton R&D – autumn 2008, CRDC, p18-20

Harris, G.A., Chudleigh, F. and Shaw, A. (2007) Sprinkler Irrigation: Profitable or Not?, The Australian Cottongrower 28(4): 38-43

Hood, S. and Brotherton, E. (2007) A Review of Siphonless Irrigation, Australian Cottongrower 28(4): 44-45

Hood, S. and Carrigan, E. (2006) Siphon-less Irrigation Systems: So how did they perform?, Australian Cottongrower 27(3):44-46

Hood, S. and Hare, J. (2009) Saving irrigation water, the environment and money, Australian Cottongrower 30(2):20-24

Pendergast, L. and Hare, J. (2007) Capacitance probes-to calibrate or not to calibrate?, Australian Cottongrower 28(6): 34-36

### ***On-line Resources***

The RWUE3 team have been working as part of the Cotton Catchment Communities CRC Water Team to publish all RWUE3 articles, updates and demonstration trial reports on the Cotton and Grains Irrigation Website established under the National Program for Sustainable Irrigation (NPSI) funded project: Knowledge Management in Irrigated Cotton and Grains. The use of the website has increased over time, with an average of 174 page views per day since its establishment in July 2007 (until 21 May 2009). There have been 5190 'unique visitors' to the site with 1500 having visited more than once.

Hood, S. and Carrigan, E. (2006) Siphon-less Irrigation systems: How are they performing?, Cotton CRC Water Team

Carrigan, E., Harris, G.A. and Hood, S. (2007), Overhead Irrigation: The challenge of a new lateral move or centre pivot: 3 case studies of performance, Cotton CRC Water Team

Pendergast, L. and Hare, J. (2007) Irrigation scheduling: Capacitance probes – to calibrate or not to calibrate?, Cotton CRC Water Team

Brotherton, E. (2008) Irrigation strategies: limited water & planting decisions, Cotton CRC Water Team

Brotherton, E. (2008) Surface irrigation: why should you evaluate your surface system – a case study in the Border Rivers, Cotton CRC Water Team

Hare, J. (2008) Using ET to Estimate Water Use, Cotton CRC Water Team

Hare, J. (2008) Tips for irrigated wheat, Cotton CRC Water Team

Hare, J. (2008) New irrigated grains supplement for WATERpak

Hare, J. and Harris, G.A. (2008) On-farm Storages: Leaky storages – what are the options?, Cotton CRC Water Team

Hare, J. and White, S. (2008) Irrigation strategies: Variety and irrigation strategy – outcomes from a Darling Downs trial, Cotton CRC Water Team

Harris, G.A. (2008) Drip Irrigation: Darling Downs Demonstration Trials, Cotton CRC Water Team

Montgomery, J., Carrigan, E. and Wigginton, D. (2007) Irrigation scheduling: EM surveys for probe placement, Cotton CRC Water Team

Pendergast, L. (2008) Winter grains: irrigated chickpea in CQ – when to plant - when to water, Cotton CRC Water Team

## ***Appendix 1***

Refer to the report submitted to DERM via Cotton Australia - **Final Report Rural Water Use Efficiency 3 Best Practice Water Use and Irrigation in Irrigated Cotton and Grain.**

### ***Part 4 – Final Report Executive Summary***

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The RWUE3 team have successfully provided the cotton and grain irrigators with the necessary knowledge and skills to adopt and implement irrigation best practice on farm. This has in turn led to more efficient irrigation practices reflected in increased production per ML. The use of irrigation best management practices has enabled cotton and grain irrigators demonstrate their environmental credentials – something that will be further enhanced by the release and implementation of myBMP. This will also enable improved documentation of the extent of best practices within the industry.

The RWUE3 team have continued to support the industry in achieving continued improvements in WUE. This is reflected in the 59 per cent improvement in IWUI within Queensland from 2002-03 to 2007-08. Data from the demonstration sites during RWUE3 show the significant improvements being obtained as a direct result of adopting irrigation best management practices promoted by RWUE3 staff – significant improvements in both GPWUI and IWUI are reported.

Current industry performance is GPWUI = 1.13 bales/ML and IWUI = 1.58 bales/ML. Therefore the target of 15% of irrigators achieving an IWUI of 2 bales/ML remains aspirational. Achievement of a IWUI target of 2 bales/ML is only possible where irrigators have made significant investments in new irrigation infrastructure (as demonstrated by the IWUI values achieved for drip and overhead system irrigation in the RWUE3 demonstration sites, and by commercial irrigators using these systems). For surface irrigation systems a more realistic target of GPWUI = 1.39 bales/ML and IWUI = 1.5 bales/ML should be set. This appears achievable based on our current knowledge. It should also be remembered that there is significant variability in the IWUI figure driven by the seasonal conditions experienced from year to year. Other measures should also be considered – particularly those related to achieving the highest possible application efficiencies for all irrigation systems being used.