Appendix 1

Equipment purchases

Industry	Equipment purchased	Description	Use	Industry comments
Flowers				
	Phytomonitoring equipment	Monitoring equipment to measure responses in crops to changing management practices	Improving water use efficiency. Testing management changes on productivity. Improve extension methods	Worked well for roses in soil. Shown that spreading the same irrigation volume over several days improved plant growth by 20–25%.
	Leafsen controllers	Leaf thickness sensor and Leafsen irrigation controller	Increase productivity in greenhouse crops. Better extension. Auto mating the work load for irrigation manager	Difficulties with understanding and implementing the technology. NCEA invited to assist.
	Acclima TDT soil moisture sensor based controllers	Soil moisture sensing and Acclima irrigation controller	Increased productivity and water use efficiency for greenhouse growers. Reduce crop stress. Better extension. scheduling practices	Acclima technology has proven very useful for monitoring and measuring key irrigation data e.g. soil moisture, soil temperature and soil EC. Trials are at an early growth stage and no yield or water use efficiency improvements have yet been observed
	Water meters (60)	Meters to record in-field water use	Benchmarking and water auditing	
	Automatic weather station (1)	Equipment to obtain climate data	Scheduling and benchmarking	
	EC/pH meter (2)	Field EC and pH meters	Water quality monitoring	
	Tensiometer (1)	Soil/water monitoring equipment	Scheduling	
	GPS (1)	Field location device	Use in mapping	
	Flowmeter (1)	Device to measure flow rate	Measuring water use	
	Enviroscan (3)	Soil/water monitoring equipment	Scheduling	Enviroscan equipment reported to be working well in field
	Computer memory, GIS software, hard drive printer, laminator	Various equipment to facilitate farm mapping	Property management planning	

Industry	Equipment purchased	Description	Use	Industry comments
	Pressure gauges and miscellaneous tools	Distribution uniformity	Irrigation system evaluation	
Nursery				
	EC/pH meter (2)	Field EC and pH meters	Water quality monitoring	All equipment is being used effectively in workshops and on site data collection
	Data projector (1)		Workshop use	
	D/O meter (1)	Dissolved oxygen meter	Field water quality monitoring	
	Laptop computer (4)		Workshop use	
	Data logger (1)	Data storage	Obtain field data	
	Computer memory, GIS software, hard drive printer, laminator	Various equipment to facilitate farm mapping	Property management planning	
	Pressure gauges & miscellaneous tools	Distribution uniformity	Irrigation system evaluation	
Turf				
	Data projector (1)		Workshop use	
	Automatic weather station (1)	Equipment to obtain climate data	Scheduling and benchmarking	
	Digital camera (1)			
	EC/pH meter (2)	Field EC and pH meters	Water quality monitoring	
	Panametric ultrasonic water meter (1)	Device to measure flow rate	Measuring water use	
	Tensiometer (2)	Soil/water monitoring equipment	Scheduling	
	Jet filled tensiometers (3)	Soil/water monitoring equipment	Scheduling	
	GPS (1)	Field location device	Use in mapping	
	Enviroscan moisture probes (12)	Soil/water monitoring equipment	Scheduling	
	MEA Gbug (2)	Soil/water	Scheduling	

Industry	Equipment purchased	Description	Use	Industry comments
		monitoring equipment		
	Computer memory, GIS software, hard drive printer, laminator	Various equipment to facilitate farm mapping	Property management planning	
	Pressure gauges and miscellaneous tools	Distribution uniformity	Irrigation system evaluation	
Dairy				
	Enviroscan equipment (4)	Soil/water monitoring equipment	Scheduling	
	Automatic weather stations (3)	Equipment to obtain climate data	Scheduling and benchmarking	
	Rising plate meters (6)	Weight-based monitoring equipment	Measuring increase in dry matter production	
	EC/pH meters (2)	Field EC and pH meters	Water quality monitoring	
	GPS (1)	Field location device	Use in mapping	
	Flowmeter (1)	Device to measure flow rate	Measuring water use	
	Enviroscan (6)	Soil/water monitoring equipment	Scheduling	Some of the enviroscan equipment has caused some issues. See comments in Dairy Industry achievements.
	Computer memory, GIS software, hard drive printer, laminator	Various equipment to facilitate farm mapping	Property management planning	
	Pressure gauges and miscellaneous tools	Distribution uniformity	Irrigation system evaluation	
Growcom				
	Pressure gauges and miscellaneous tools	Irrigation system assessment kits	Irrigation system evaluation	
	Automatic weather station (3)	Equipment to obtain climate data	Scheduling and benchmarking	
	Enviroscans (6)	Soil/water monitoring equipment	Scheduling	

Industry	Equipment purchased	Description	Use	Industry comments
	EC/pH meter (2)	Field EC and pH meters	Water quality monitoring	
	Tensiometers (14)	Soil/water monitoring equipment	Scheduling	
	Evaporation/seepage meter (2)	Data logger & climate data	Monitor water loss from storages	
	GPS (1)	Field location device	Use in mapping	
	Flowmeter (1)	Device to measure flow rate	Measuring water use	
	Troll flow probe (2)	Probe to measure a number of water quality parameters	Water quality monitoring	
	Computer memory, GIS software, laminator	Various equipment to facilitate farm mapping	Property management planning	
	Pressure gauges and miscellaneous tools	Distribution uniformity	Irrigation system evaluation	

Appendix 2

Research and development and software development projects

Nursery EcoHort™ audit tool

This project constituted the development of an EcoHort™ database (Access) that will capture all information from the EcoHort™ risk assessment checklist. The checklist is programmed into the handheld PDA with all audits completed through checking the fields on the screen. This will aid the SEQ-IF project in proactively targeting common problems and gaps identified in the audit process and align the project direction to address priority areas. NGIQ will be able to view trends across the client base. Furthermore, the database will allow for the cost savings of data entry and improve reporting content through significant efficiency gains.

The EcoHort™ audit tool is an integrated tool for use with a laptop/desktop solely or with a PDA. The tool uses Microsoft Access, HanDbase with a custom designed interface.

IPART

This has become one of the KMSI tools—see Appendix 6.

IPERT

This has become one of the KMSI tools—see Appendix 6.

Growing media water adsorption characteristics—nursery industry

This project aimed to test and determine a range of physical properties including the water absorption rates, wettability, water holding capacity, water retention efficiency and bulk density of a number of key growing media currently being utilised by Australian production nurseries. The data will guide industry in improved irrigation scheduling, irrigation system design and equipment selection.

Sprinkler performance and evaluation—nursery industry

Specifications for up to 50 sprinklers from the top 10 manufacturers have been checked and evaluated for performance verification using the software program SPACE Pro. The modelling entails specified arrays and produces a report detailing the mean application rate, the coefficient of uniformity (CU) and the scheduling coefficient (SC–5 per cent).

‘Gains’ evaluation spreadsheet—nursery industry

The NGIQ gains table Excel spreadsheet has been developed to calculate summary statistics on the water savings and production gains obtained by nursery industry operators in response to the RWUEI/SEQIF programs. It is also used to evaluate progress towards achieving water savings and production gains based on various levels of interaction between growers and extension personnel and engagement in industry provided programs.

Data collation—dairy and fodder industries

This project collated, processed and analysed water use efficiency data from industry research programs including those from RWUEI programs and industry water use efficiency research and demonstration projects relating to the dairy and fodder industries. Relevant data has been input to IPART for further analysis. This will provide more accurate benchmarking of water use and production for producers.

Plant water use efficiency—nursery industry

Queensland Primary Industries and Fisheries, and GrowSearch at Redlands Research Station were engaged to review the information currently available for water use classification systems with the intention to standardise these. This involved conducting a desktop review of scientific databases and journals, trade publications, council and grower group websites and governmental reports for information on plant water use. References to a water classification system such as 1 drop, 2 drop, 3 drop or low, medium, high water use were included as well as any information regarding irrigation

grouping or specific plant variety crop factors. The information was assessed and were possible was categorised into water use classes/groups according to the volume of water suggested for irrigation.

Weight-based scheduling—nursery industry

This project was developed to prove whether load cells or field positioned weight scales can accurately record or monitor plant water use and hence be used to assist in irrigation scheduling. A two stage trial was conducted comparing the gravimetric weight method against three load cell prototype units under development. In stage one, daily weight measurements of the treatment containers were collected and the volume of moisture lost calculated. The volume of water lost was applied as irrigation to return the container weight back to a pre-determined upper moisture content. In stage two the containers were allowed to dry out to a pre-determined lower moisture content and only irrigated once container weight reached this lower point. Water use data showed that using an upper and lower weight corresponding to moisture content required has the potential to reduce water use considerably when compared to timed irrigation.

Short message service—all industries

A number of irrigators trialled the short message service (SMS) daily delivery of evapotranspiration data from the CRCIF irrigateway server at CSIRO Griffith. It uses data that has been synthesised to a 5km grid derived from the SILO database. They were supported by both the RADS team and industry IDOs. The server is a gateway to many irrigation services that include SMS weather and irrigation decision support services which deliver daily information on water requirements of crops to irrigators through SMS, allowing them to better schedule irrigations. The service is being trialled in a number of locations Australia wide and has been expanded to become an irrigation scheduling service.

A survey of participants showed they were not convinced of the accuracy of the data. Users were happy to receive data although only a few actually used the data for scheduling.

Appendix 3

Financial matters

Expenditure

Industry programs

Industry	2005–06	2006–07	2007–08	2008–09	Total
Qld Dairyfarmers' Organisation	$365 000	$329 000	$329 000	$329 000	**$1 352 000**
Flower Association	$65 000	$111 000	$111 000	$111 000	**$398 000**
Growcom	$175 000	$190 000	$190 000	$190 000	**$745 000**
Nursery industry	$132 000	$160 000	$160 000	$160 000	**$612 000**
Turf producers	$63 000	$110 000	$110 000	$110 000	**$393 000**
Total	**$800 000**	**$900 000**	**$900 000**	**$900 000**	**$3 500 000**

Coordination and support

SEQ Catchments	2005–06	2006–07	2007–08	2008–09	Total
Value	$200 000	$200 000	$200 000	$70 000	**$670 000**

Research and development support

National Centre for Engineering in Agriculture/CRCIF	2005–06	2006–07	2007–08	2008–09	Total
RADS	$200 000	$200 000	$200 000	$200 000	**$800 000**

Whole-of-region

Item	2005–06	2006–07	2007–08	2008–09	Total
Equipment	$231 000	$90 661.82	$92 379.12	$44 827.56	**$458 868.50**
KMSI, tools and web			$175 000	$133 760	**$308 760**
Scoping study and statistics collation	$70 000	$53 750	$41 500	$20 750	**$186 000**
R&D projects		$15 000	$35 000	$32 629	**$82 629**
Total	**$301 000**	**$159 411.82**	**$343 879.12**	**$231 966.56**	**$1 036 257.50**

Appendix 4

Water savings calculations

DAIRY Region **SEQ-IF**

A. WATER SAVING, ML

Calculated using the Number of Growers for each contact level.

Contact level #	Regional Data * Number of Growers	Savings ML / grower		Error Level +/- %		Saving, by Number for Region Ml Low	Nominal	High
a	b	c		d		e	f	g
refer # below	from your records	from own data		refer # bottom		f - d	b x c	f + d
Direct	34	62.9		2		2097	2140	2183
		% Making Savings		Savings % of direct				
High	141	75	90	50	90	3328	5258	7189
Medium	97	30	50	50	90	916	1832	2747
Low	200	10	20	50	90	629	1448	2266
Total	472					**6970**	**10677**	**14385**

FLOWERS Region **SEQ-IF**

A. WATER SAVING, ML

Calculated using the Number of Growers for each contact level.

Contact level #	Regional Data * Number of Growers	Savings ML / grower		Error Level +/- %		Saving, by Number for Region Ml Low	Nominal	High
a	b	c		d		e	f	g
refer # below	from your records	from own data		refer # bottom		f - d	b x c	f + d
Direct	6	9.0		2		53	54	55
		% Making Savings		Savings % of direct				
High	24	75	90	50	90	81	128	175
Medium	36	30	50	50	90	49	97	146
Low	34	10	20	50	90	15	35	55
Total	100					**198**	**314**	**431**

GROWCOM Region **SEQ-IF**

A. WATER SAVING, ML

Calculated using the Number of Growers for each contact level.

Contact level #	Regional Data * Number of Growers	Savings ML / grower		Error Level +/- %		Saving, by Number for Region Ml Low	Nominal	High
a	b	c		d		e	f	g
refer # below	from your records	from own data		refer # bottom		f - d	b x c	f + d
Direct	14	33.6		2		461	470	480
		% Making Savings		Savings % of direct				
High	186	75	90	50	90	2342	3701	5059
Medium	220	30	50	50	90	1108	2216	3324
Low	580	10	20	50	90	974	2240	3506
Total	1000					**4885**	**8627**	**12368**

NURSERY Region **SEQ-IF**

A. WATER SAVING, ML

Calculated using the Number of Growers for each contact level.

Contact level #	Regional Data *			Error Level		Saving, by Number for Region Ml		
	Number of Growers	Savings ML / grower		+/- %		Low	Nominal	High
a	b	c		d		e	f	g
refer # below	from your records	from own data		refer # bottom		f - d	b x c	f + d
Direct	143	9.6		2		1347	1374	1401
		% Making Savings		Savings % of direct				
High	0	75	90	50	90	0	0	0
Medium	165	30	50	50	90	238	476	713
Low	242	10	20	50	90	116	267	419
Total	550					**1701**	**2117**	**2533**

TURF Region **SEQ-IF**

A. WATER SAVING, ML

Calculated using the Number of Growers for each contact level.

Contact level #	Regional Data *			Error Level		Saving, by Number for Region Ml		
	Number of Growers	Savings ML / grower		+/- %		Low	Nominal	High
a	b	c		d		e	f	g
refer # below	from your records	from own data		refer # bottom		f - d	b x c	f + d
Direct	6	15.0		2		88	90	92
		% Making Savings		Savings % of direct				
High	33	75	90	50	90	186	293	401
Medium	24	30	50	50	90	54	108	162
Low	13	10	20	50	90	10	22	35
Total	76					**338**	**514**	**690**

Appendix 5

Industry reported water savings and productivity improvements

To assist industries to report on water use efficiency gains and productivity improvements Professor Steven Raine of the University of Southern Queensland developed an Excel spreadsheet to enable these statistics to be generated. The most recently developed spreadsheet or 'gains table' for the nursery industry is based on four main worksheets:

- summary
- grower data entry
- production by sector
- high interaction savings.

Activities within the SEQ-IF program are recorded and have been grouped according to the level of engagement with growers through these activities (e.g. direct, high, medium, low).

Dairy

The DFWP team has been conducting evaluations of systems that have received financial assistance through the program. These evaluations have verified water use efficiency and productivity gains from changing/upgrading systems and are supported by research conducted at the QPI&Fs Mutdapilly Research Station.

In order to present data of water use efficiency gains the DFWP team collected a range of data through different avenues which, when combined, provided a higher degree of confidence in the data sets obtained.

Data collected from the DFWP water use efficiency projects show:

- producers who installed a centre pivot, subsurface drip, or lateral move irrigator through the financial assistance scheme derived on average water use efficiency /productivity gains of 20 per cent
- producers who installed a solid set or k-line irrigation system through the financial assistance scheme derived on average water use efficiency /productivity gains of 15 per cent
- producers who installed system upgrades such as underground mains and pump upgrades through the financial assistance scheme derived on average water use efficiency /productivity gains of five per cent
- producers who undertook an on-farm system assessment derived an average water use efficiency /productivity gain of approximately seven per cent
- producers who have attended the water use efficiency workshop series on average have achieved water use efficiency /productivity gains of approximately five per cent.

Results from the effluent management and reuse section of the program has also been incorporated with the DFWP and Dairying Better and Better for Tomorrow programs achieving the additional reuse of approximately 510 ML of effluent per annum which has a current fertiliser replacement equivalent value of approximately $572 730 per annum (refer Table 8).

Table 7 provides the water use efficiency results achieved by the DFWP program. Overall, the DFWP program has delivered water use efficiency /productivity gains of 2927 ML per year or over the last three years efficiency gains of 8781 ML or 15 per cent of the dairy industry's existing water use. In addition, efficiency gains of 1237 ML for fodder have also been attained, resulting in an overall program efficiency gain of 10 018 ML.

If these results are translated to the value of water savings as calculated by independent industry consultants Barraclough, whom calculated the value of a ML of water at $4900 from their audits undertaken during the year 2000, then the above water use efficiency /productivity gains of 10 018 ML would equate to $49.09 million.

Dairy

Level of Contact	How Measured	Examples	Type of System Installed	Number of dairy farms	Avg Water used / year (dairy) #	Number of fodder farms	Avg water used / year (fodder) #	Confidence Level of Water Efficiency Saving (+/- %)	Efficiency Saving & Productivity Gains	Level of Water Efficiency Saving & Productivity Gains (ML) / Year (dairy)	Level of Water Efficiency Saving & Productivity Gains (ML) / Year (fodder)
High	Measured recorded data	On Farm FAS Water Use Efficiency projects	Centre Pivot or Lateral Move	8	324	3	149	5%	20%	493	85
			Subsurface drip			2	116	5%	20%		44
			Solid set or K-line	12	144	1	35	5%	15%	245	5
			Current system upgrades (underground mains and pump upgrades)	10	251	5	165	5%	5%	119	39
			TOTAL FAS	**30**	**228**	**11**	**137**			**857**	**173**
		On Farm System Assessments		**14**	**260**	**4**	**137**	**10%**	7%	**230**	**35**
Medium	Accurate estimates based on data collected	DFWP Workshops / Study Tours		**99**	**260**	**26**	**137**	**15%**	**5%**	**1,096**	**151**
Low	Subjective professional appraisal	WUE extension material sent out producers		**60**	**260**	**26**	**137**	**25%**	**2%**	**234**	**53**
Totals for Water Use Efficiency Gains per Annum										**2,417** *	**412 ML**
Totals for Effluent Water Reuse per Annum										**510**	
Project Total – (based on 3 years of the DFWP program from a dairy industry base of 57,980 ML)										**8,781 ML or 15%**	**1,237 ML**

Notes: * This total figure is a composite of direct irrigation efficiency gains and increased productivity, for each category, for existing water use in a normal year.

The project obtained actual quantities of water used per farm per year for those projects undertaking system instalments via FAS. Additional data was also obtained via questionnaires contained in OFSA and FAS applications. Data was obtained from 56 dairy respondents who indicated total irrigation usage of 14,582 ML/year (average per farm = 260 ML/year) and 10 fodder respondents with an average of 137 ML/year. There are 248 dairy enterprises in the SEQIF region, of which approximately 90% are irrigated (ie. 223 irrigated dairy enterprises). Applying the average per farm of 260 ML, then the industry base is 57,980 ML of irrigation water supply in the SEQIF region of the dairy industry.

Growcom

	Calculated using the Number of Growers for each contact level.					
Contact level #	Regional Data *		Error Level	Saving, by Number for Region Ml		
	Number of Growers	Savings Ml/Grower	+/- %	Low	Nominal	High
Direct	14	8.3	2	113	116	118
High	25	6.2	15	132	155	178
Medium	460	4.0	25	1380	1840	2300
None	501	0.5	75	63	251	438
Total	1000			1688	2361	3035

Nursery

Contact level #	Regional Data *		Error Level	Saving, by Number for Region ML		
	Number of Growers	Savings (ML/grower)	+/- %	Low	Nominal	High
Direct	31		5	0	0	0
High	37	7.3	20	216	270	324
Medium	95	5.0	30	333	475	618
Low	36	2.5	40	54	90	126
None	351	1.5	75	132	527	921

Table (A) reflects the project gains achieved through the various levels of grower participation in the SEQ-IF Nursery Production project. Based on the estimated irrigation application of 22.5 ML per hectare in SEQ production nurseries (can be as high as 29 ML/ha) and an average industry economic return of $391 000 per hectare the average value per ML applied is $17 400. Table (A) indicates that the SEQ-IF Nursery Production project has to date delivered nominal water savings of 1362 ML at an economic return of more than $23 million.

The project has not included the water savings from the ‘direct’ measured growers due to incomplete details caused by the projects lack of capacity to finalise the assessments. Based on current incomplete data the direct measured growers have shown average water savings of 5 ML per hectare for a total 155 ML saved in the region. This would give total adjusted water saving across the region of 1517 ML and an economic value of water saved exceeding $26.5 million.

Flowers

In SEQ, 6 of the larger growers and the industry's biggest water users have reduced their reliance on the municipal supply by more than 40 per cent through recycling, catching rainwater and monitoring leachate from their growing systems. Other growers are continuing to improve their scheduling through on-farm monitoring. It is estimated that more than a 10 per cent improvement in water use efficiency has been achieved by the hydroponic growers. With the native and other in-ground growers, there has been an improvement in water use efficiency by improving scheduling and better understanding of crop water use throughout the soil profile. With improved rainfall, irrigation on native farms has been reduced to fertigation only in many cases, reducing total irrigation water applied by more than 10 per cent.

Turf

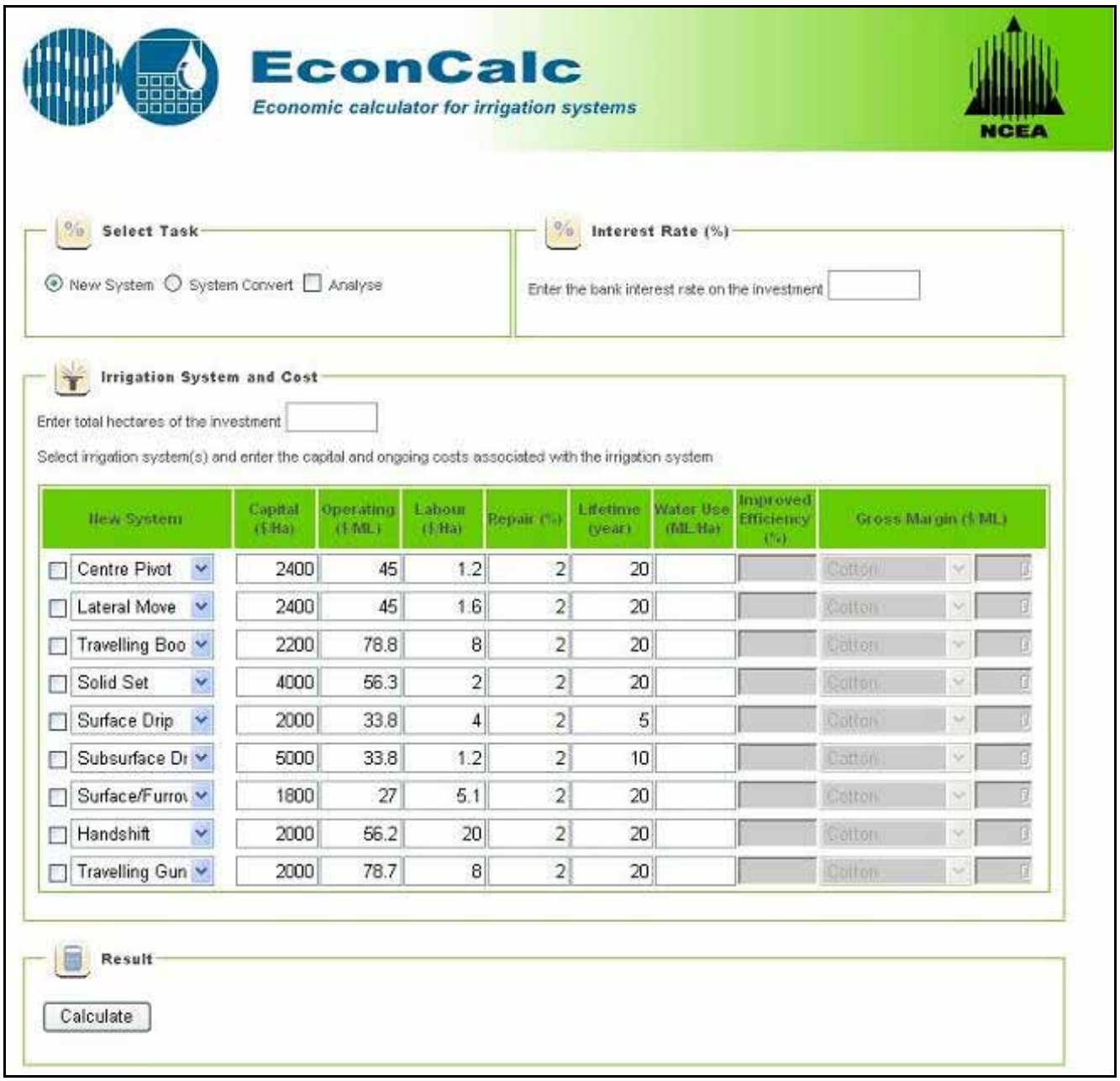
The turf industry did not use the methodology adopted by Growcom, nursery or QDO to determine water use efficiency gains. Their assessment of achievement in this area is based on the number of their growers who had irrigation system assessments carried out and improved their distribution uniformity that was confirmed by a second assessment. As a result they quote eight per cent of growers who have made gains in water use efficiency. This would equate to the 'direct' contact statistic used by the others and does not account for other levels of engagement that are likely to have produced efficiency gains.

Appendix 6

KMSI tools, calculators and web

EconCalc—an economic calculator for irrigation systems

EconCalc home page



EconCalc <www.econcalc.ncea.biz> is a decision support tool that can be used to economically evaluate the costs and benefits of purchasing new or upgrading existing irrigation systems.

The tool calculates several economic performance indicators:

- nett present value (NPV)
- annual costs and benefits
- internal rate of return (IRR)
- cost/benefit ratio

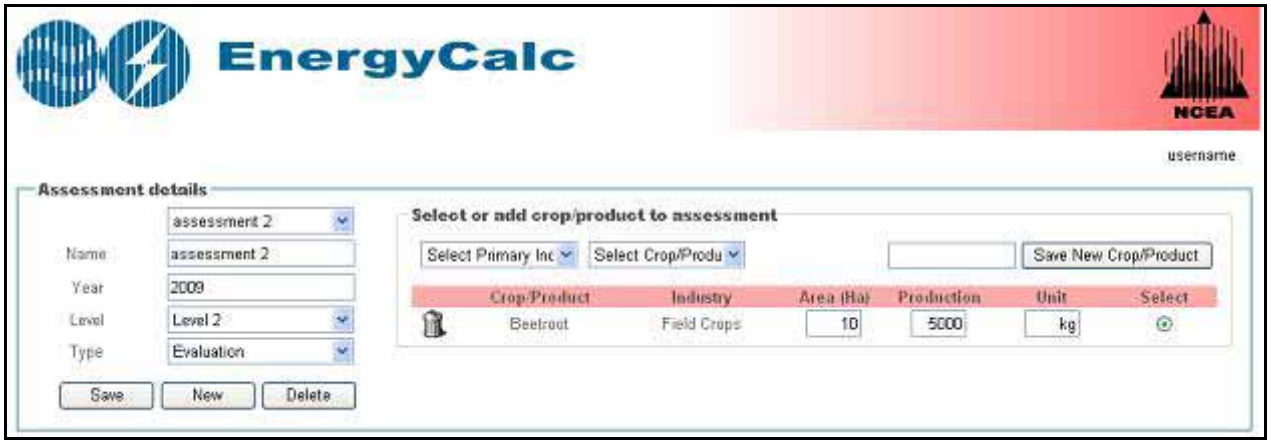
Users are able to enter an interest rate; cropping area; water use values and several investment costs into the calculator to evaluate a specific economic scenario on a farm.

The tool automatically provides default investment values for the various irrigation systems but the user can change these values to suit their situation.

EconCalc was developed by the National Centre for Engineering in Agriculture for the KMSI project, an initiative of the SEQ-IF program.

EnergyCalc - calculating energy use for on-farm practices

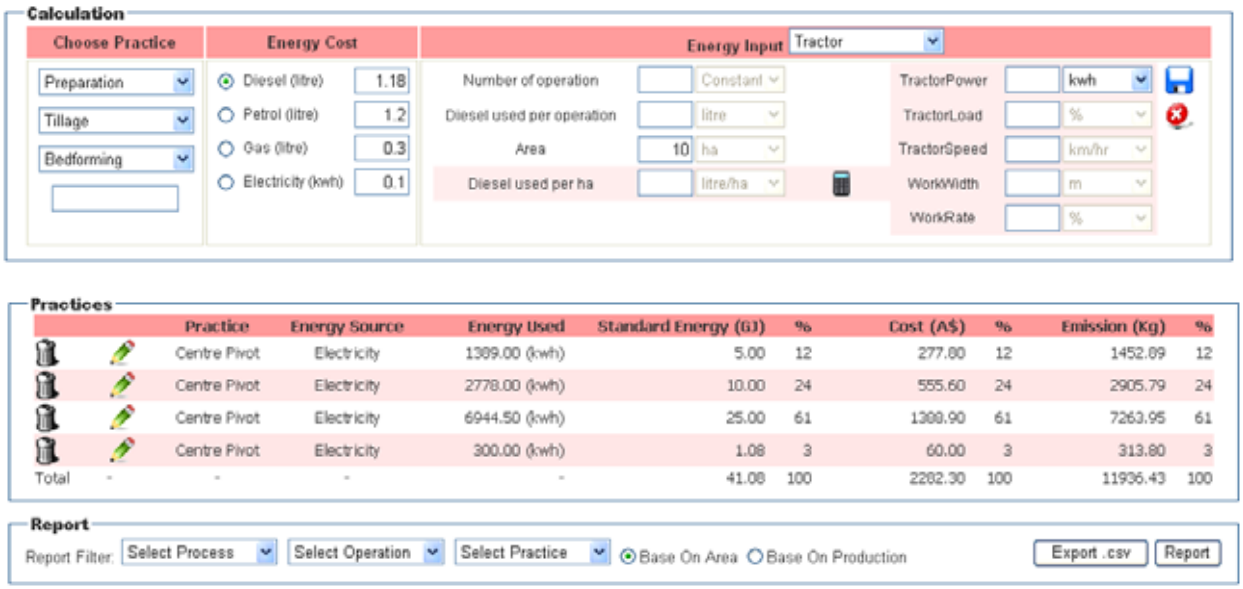
Front page of EnergyCalc



EnergyCalc <http://energy.ncea.biz> is web-based software created to assist growers and industry extension people to formulate on-farm scenarios for calculating energy use and costs of farm machinery.

Users can set up scenarios and save them for future reference. Each scenario focuses on a specific crop and various management practices can be applied to the crop from drop down menus. From there the user can enter energy costs and machinery input values. See figure below.

Results of each scenario are tabulated with energy consumption; cost and GHG emissions



IPART—for storing and reporting on irrigation system evaluations

The IPART <http://139.86.208.170/kmsi/ipart> tool is a web database designed to store and evaluate data from irrigation system audits.

Data from field evaluations for specific irrigation systems, such as travelling guns and centre pivots, are entered through the tool's web interface.

The tool can execute various functions with the data such as:

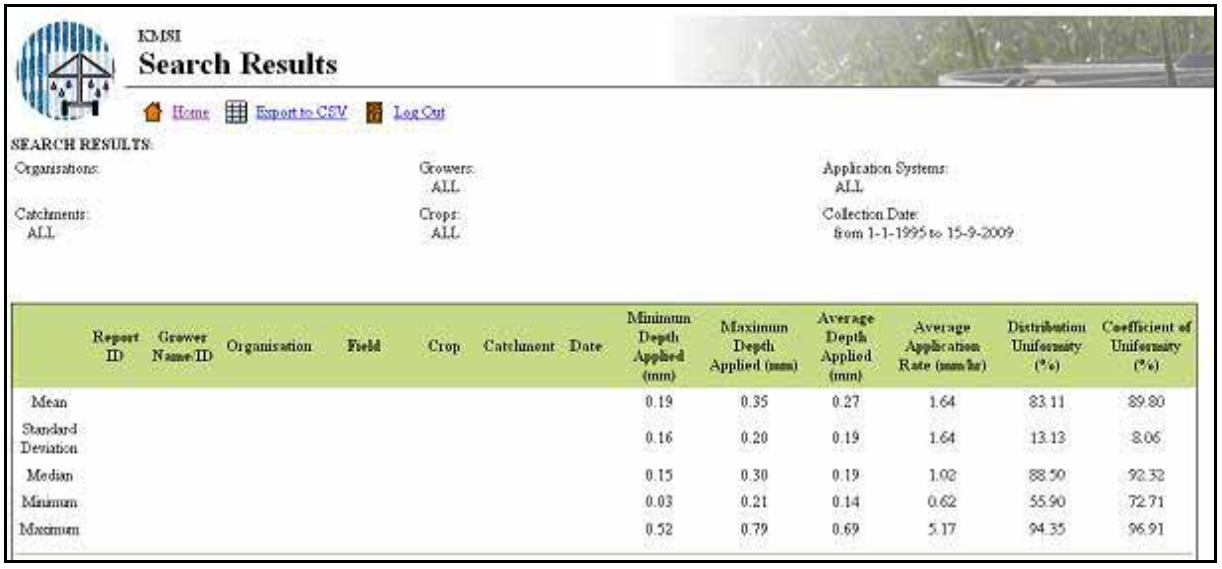
- detailed reports for individual growers so they may see how their system is performing e.g. distribution uniformity and coefficient of uniformity.
- recommended actions to improve performance
- graphical output to give irrigators a visual concept of what is happening in their paddock.

The user can also retrieve data by categories such as specific crops or by catchment through the tool's search facility.

The search engine can summarise statistics to show performance indicators for regions; cropping or irrigator type.

Rural industries and private consultants use IPART to assist with their in-field extension work with irrigators. Irrigation researchers can also use the tool to help with irrigation water use efficiency research.

Irrigation application statistic


KMSI
Search Results
Home Export to CSV Log Out
SEARCH RESULTS:
Organisations: Growers: ALL Application Systems: ALL
Catchments: ALL Crops: ALL Collection Date: from 1-1-1995 to 15-9-2009

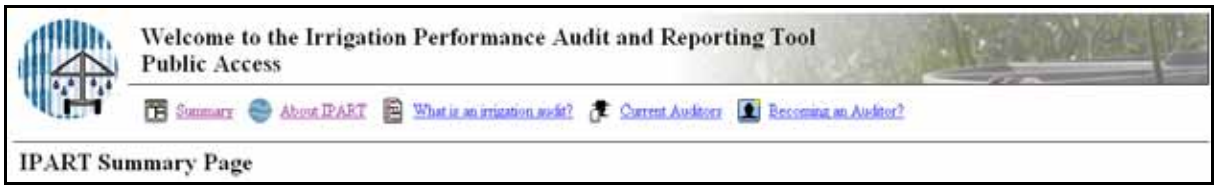
	Report ID	Grower Name/ID	Organisation	Field	Crop	Catchment	Date	Minimum Depth Applied (mm)	Maximum Depth Applied (mm)	Average Depth Applied (mm)	Average Application Rate (mm/hr)	Distribution Uniformity (%)	Coefficient of Uniformity (%)
Mean								0.19	0.35	0.27	1.64	83.11	89.80
Standard Deviation								0.16	0.20	0.19	1.64	13.13	8.06
Median								0.15	0.30	0.19	1.02	88.50	92.32
Minimum								0.03	0.21	0.14	0.62	55.90	72.71
Maximum								0.52	0.79	0.69	5.17	94.35	96.91

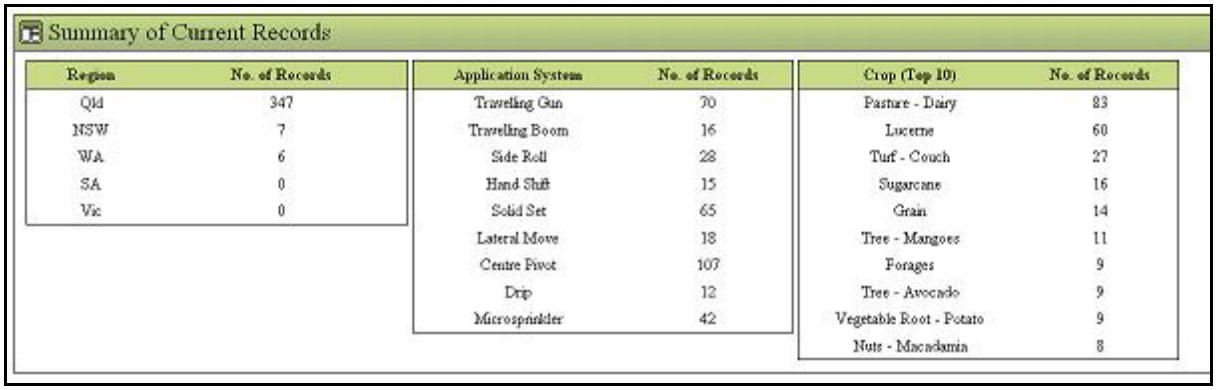
A major feature of IPART is its provision to secure specific farm data so that an irrigator's privacy is protected.

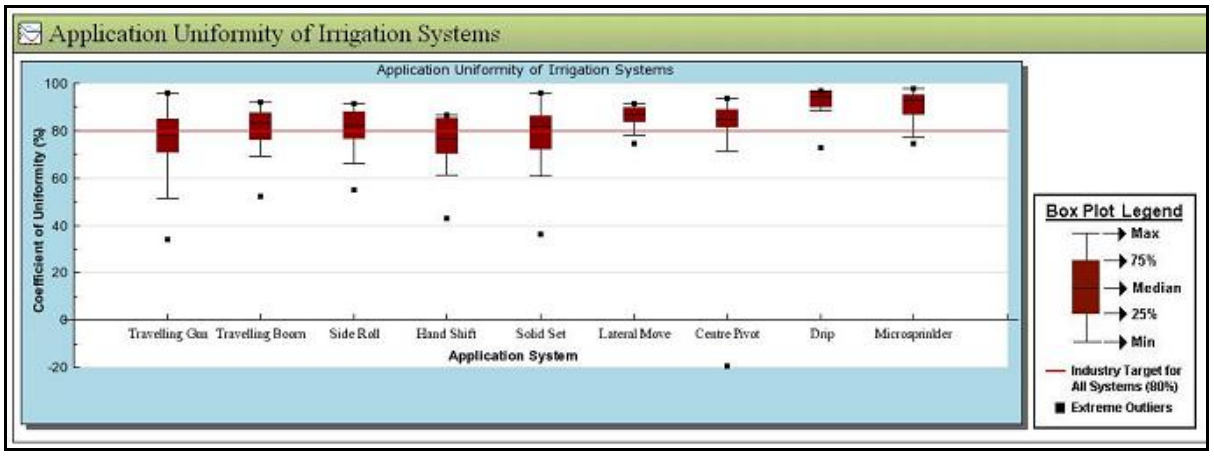
IPART public access

IPART performance statistics can also be searched through a public access web page at <139.86.208.170/kmsi/public_search.php>. The search facility can interrogate the data into categories, thus providing irrigators the opportunity to compare their systems against other in their industry or region.

Example of IPART public access result



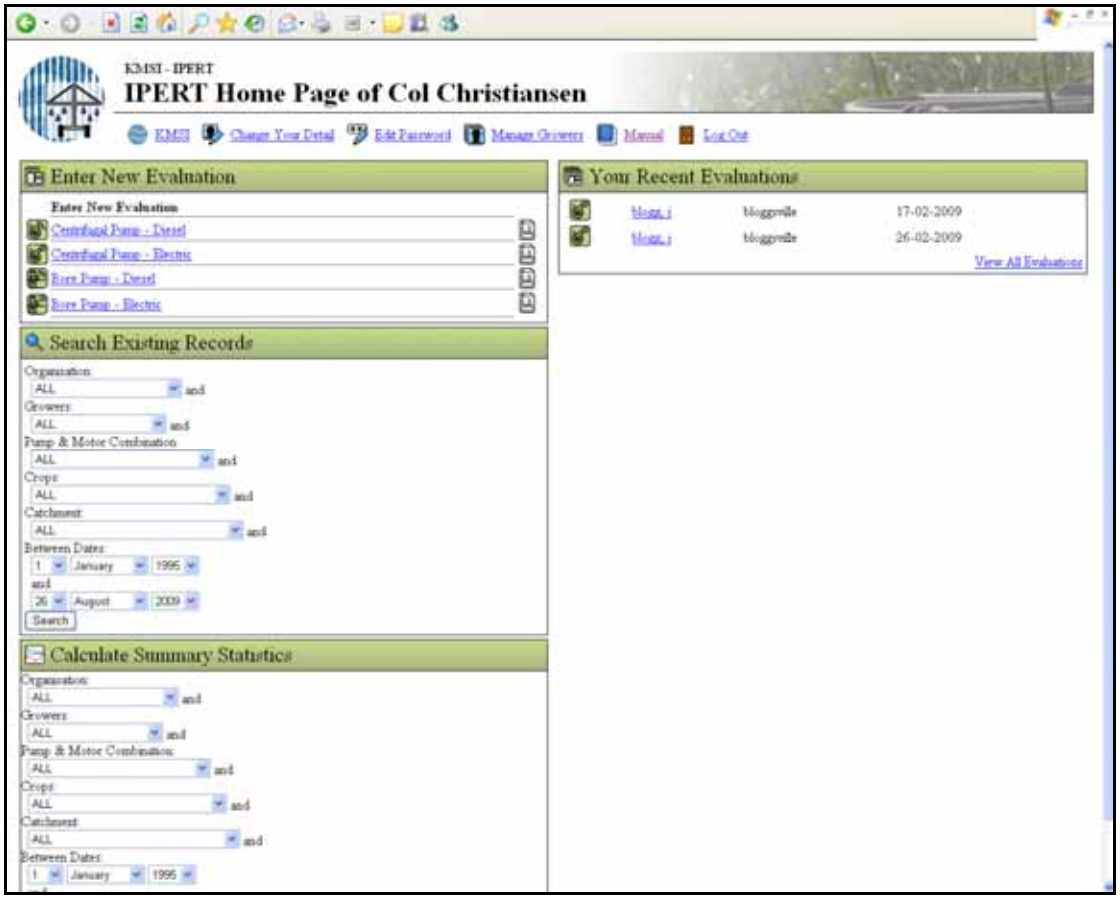




IPART was developed by the National Centre for Engineering in Agriculture for the KMSI project, an initiative of the SEQ-IF program.

IPERT—for collating and reporting on data from irrigation pump evaluations

IPERT home page



IPERT <http://ipert.ncea.biz> is a software tool designed to store data obtained from an evaluation of an irrigation pumping system.

The tool is able to perform a range of functions such as:

- data recording
- calculation of performance indicators
- graphical representation and presentation
- making recommendations.

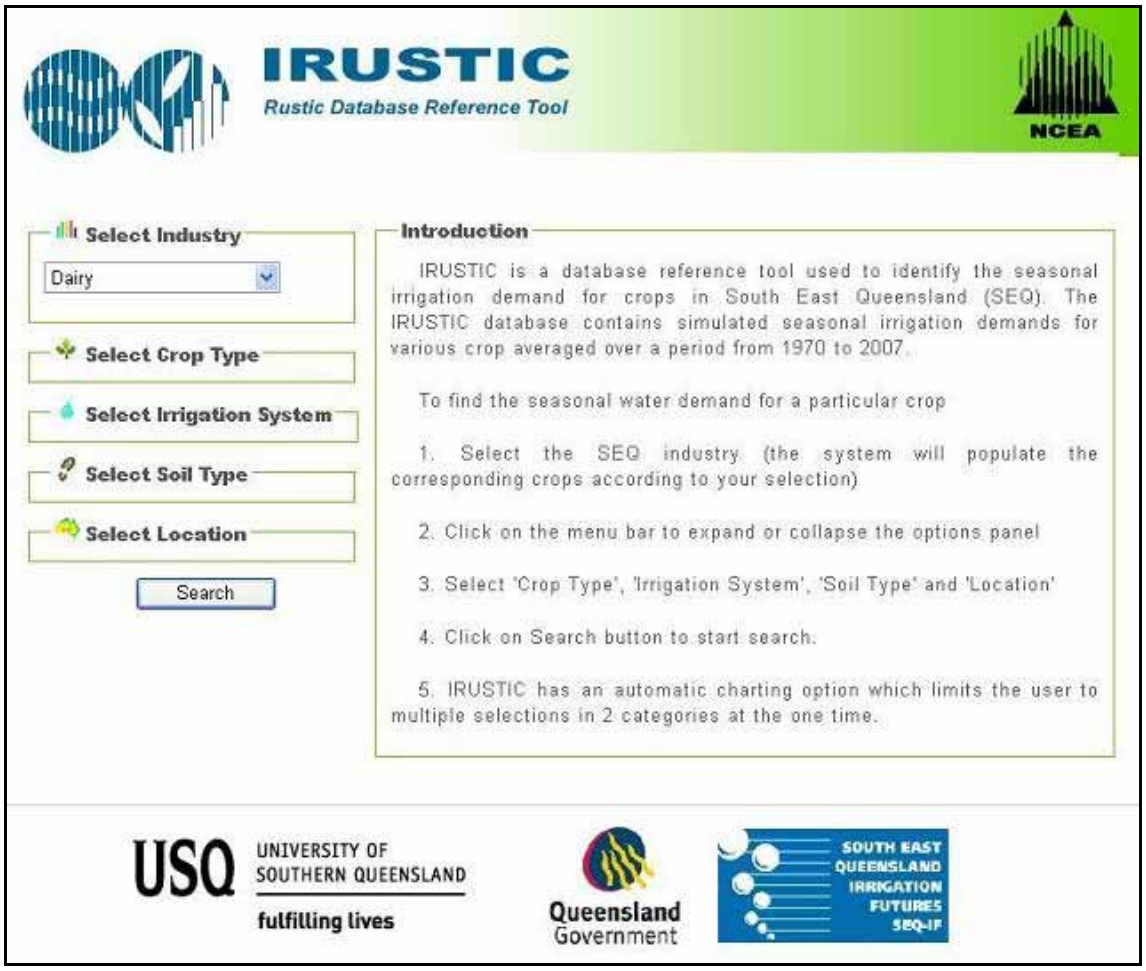
IPERT's search engine is able to retrieve data in several categories.

Reports in IPERT are aimed at irrigators who need to know how there system is performing. The reports include performance indicators as well as recommended actions to improve performance. IPERT also provides graphical output to give irrigators a visual concept of what is happening in their paddock

It also allows an irrigator to compare this performance against similar irrigation systems, both locally and regionally.

The IRUSTIC reference tool

IRUSTIC home page



IRUSTIC <irustic.ncea.biz> is a computer database for referencing annual water demands for a variety of crops grown within South East Queensland.

The water demands have been calculated for various irrigation systems; soil types, and regional locations and are expressed in megalitres per year (ML/yr).

Users of IRUSTIC can make selections from drop down menus of each parameter and generate a report from the results of their search.

IRUSTIC was developed by the National Centre for Engineering in Agriculture for KMSI project, an initiative of the SEQ-IF program.

Data in the IRUSTIC tool has been sourced using a hydrological computer model called the runoff storage and irrigation calculator or RUSTIC.

RESSTAT—for regional statistics

Irrigation statistics

RESSTAT <http://139.86.208.170/kmsi/survey_statistics.php> is a computer database built to assist industry extension staff and consultants to collect annual property level information on irrigation practices in South East Queensland and to report on various statistics based on that information.

Irrigation practice information is gathered via industry specific survey questionnaires which are formatted to capture pertinent information about water sources; management practices; farm details; demographics; and irrigation production.

RESSTAT accepts input from surveys through an interface on the web which also facilitates reporting on statistical parameters that includes catchments; production types and demographics. Reports are produced in graphical output such as charts and graphs that clearly show statistical trends. Results can be downloaded to a spreadsheet or another database.

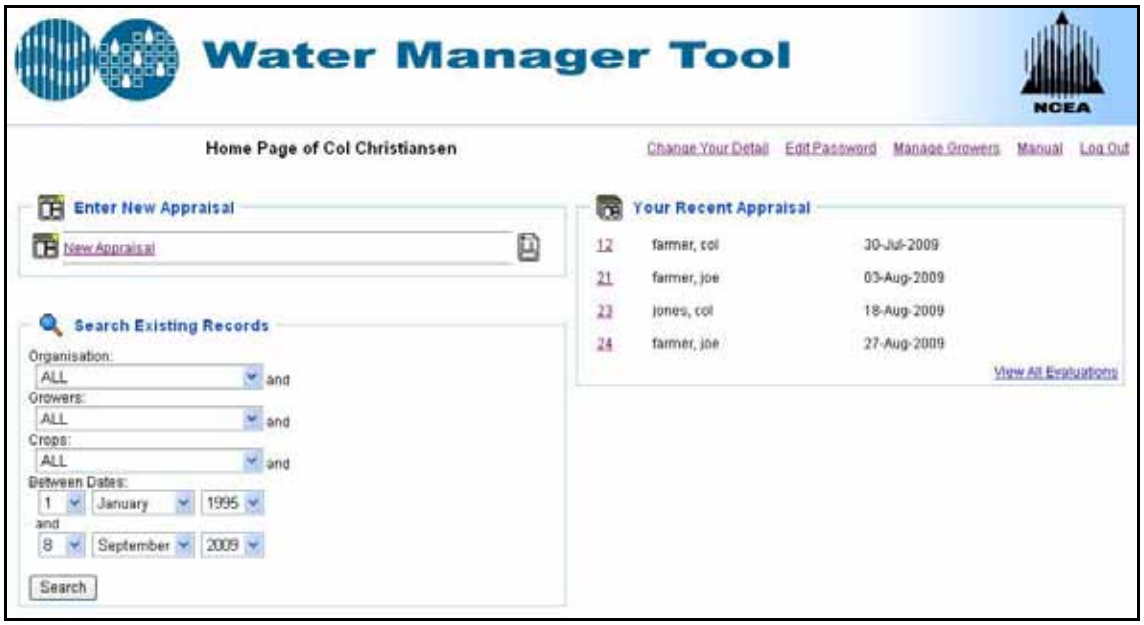
The key feature of RESSTAT is its ability to compare grower statistics thus allowing performance benchmarking.

While a grower has some personal information stored in the database, RESSTAT's security system only allows such details to be open to the grower's industry consultant. Other users cannot access that information. All reports shown on-line as well as exported data do not show personal info.

RESSTAT was developed by the National Centre for Engineering in Agriculture for the Knowledge Management System for Irrigation project.

Water Manager Tool—assessing irrigation management on-farm

Water Manager Tool home page



The Water Manager Tool <http://watermgttool.ncea.biz> is a decision support software tool to assist individual growers with crop/water management. Industry extension officers use this tool to engage with growers about better irrigation management for cropping.

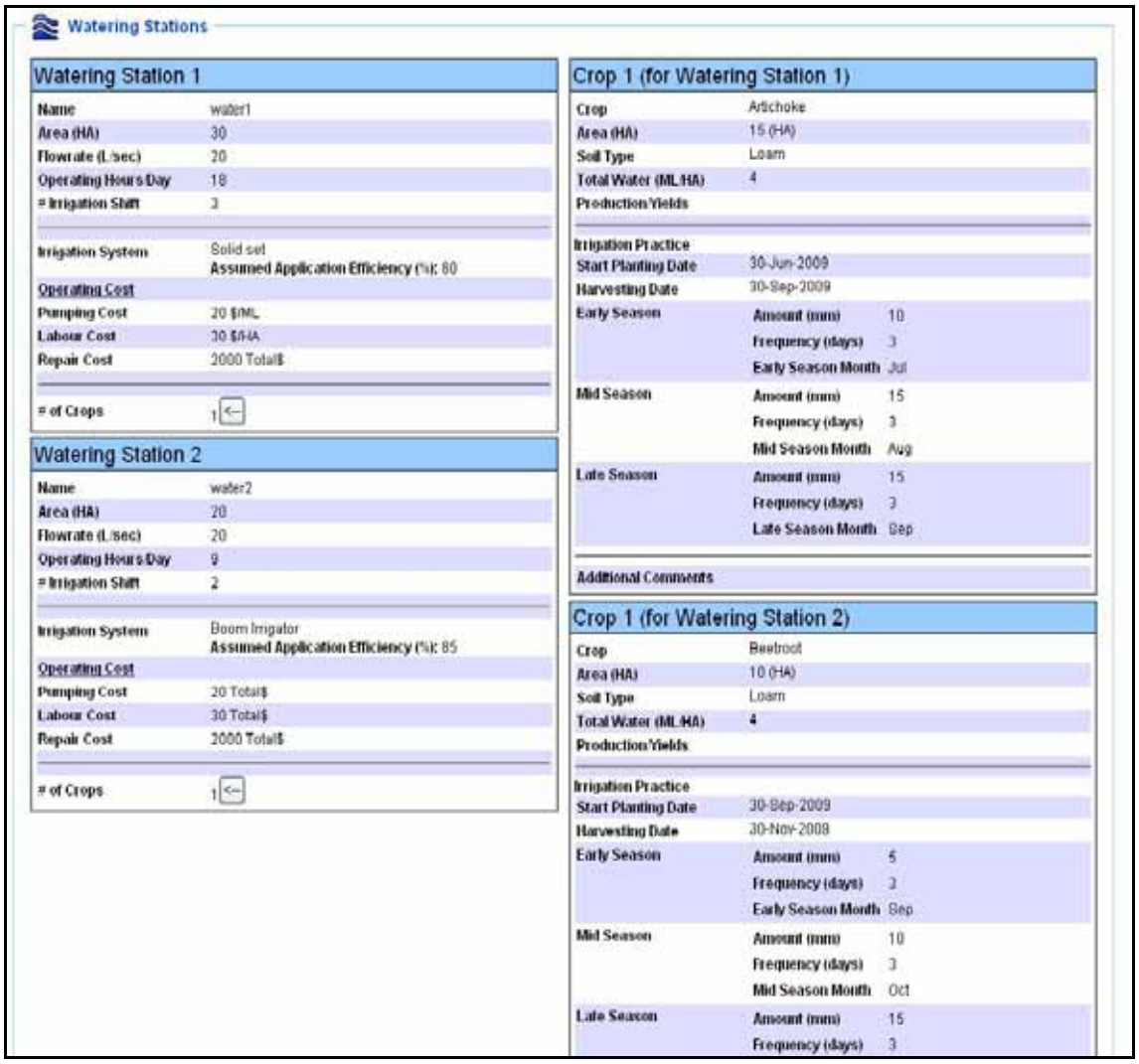
The tool allows the user to subdivide an irrigated farm into many watering zones in accordance with the layout of their irrigation system and further divide those zones into specific crop areas. The crop area allows information to be entered about the growing season; water needs and area of crop. Thus Water Manager Tool can gather water supply and application data for the whole farm and distribution network.

Some important features of Water Manager Tool are:

- a security system that restricts access to personal information to a grower's industry consultant
- a search facility for downloading general information in categories such as catchment and crop type.

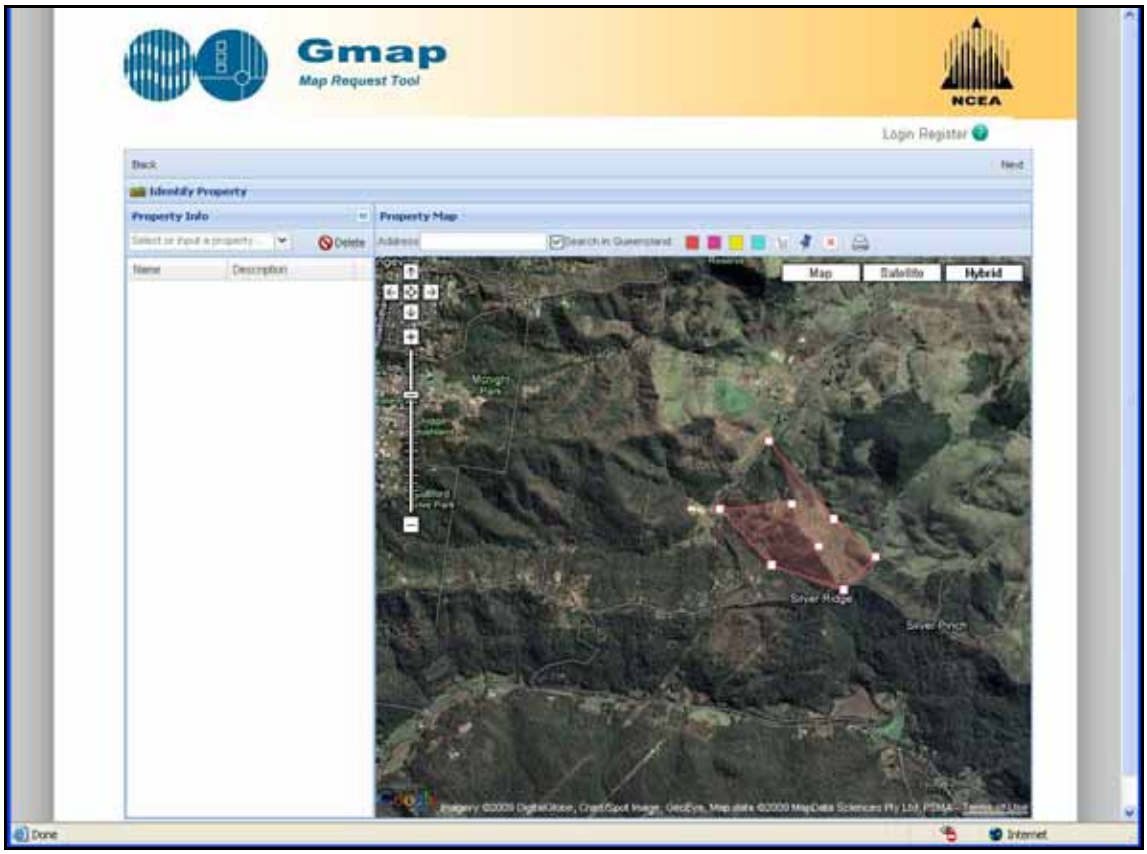
The Water Manager Tool was developed by the National Centre for Engineering in Agriculture for the Knowledge Management System for Irrigation project.

Water Manager Tool summary page



Gmap

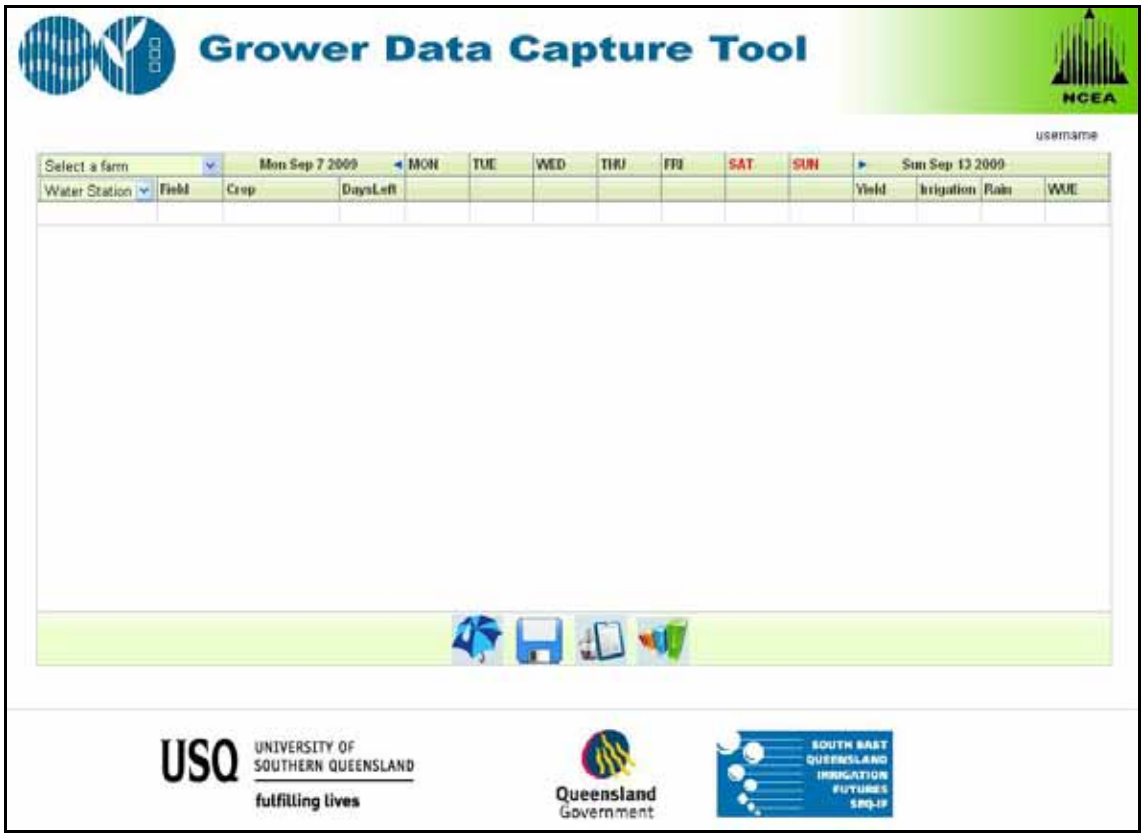
Gmap home page



GMAP <http://www.gmap.ncea.biz> is a map request application developed for the engagement of landholders in natural resource management. It provides landholders with property maps, natural resource management maps, and information about industry groups and their initiatives to better connect landholders with the right information for improved property management.

Grower Data Capture Tool

Grower data home page



The Grower Data Capture Tool <http://www.gdc.ncea.biz> is a tactical decision support tool with simple irrigation recording and scheduling features based on evapotranspiration (ET). The grower data capture tool allows irrigators to record irrigation and rainfall while also calculating daily crop water use. The grower data capture tool assesses crop water needs (i.e. supply vs. demand) based on the actual irrigation amount, irrigation frequency, rainfall and crop water use.

KMSI toolbox page

KMSI toolbox home page

KMSI <www.kmsi.ncea.biz> is the Knowledge Management System for Irrigation, developed by the National Centre for Engineering in Agriculture with funds provided by the Queensland Government as part of the South East Queensland Irrigation Futures project. This page gives an overview of the tools and calculators developed to assist irrigators and irrigation industry personnel to improve on-farm irrigation management.

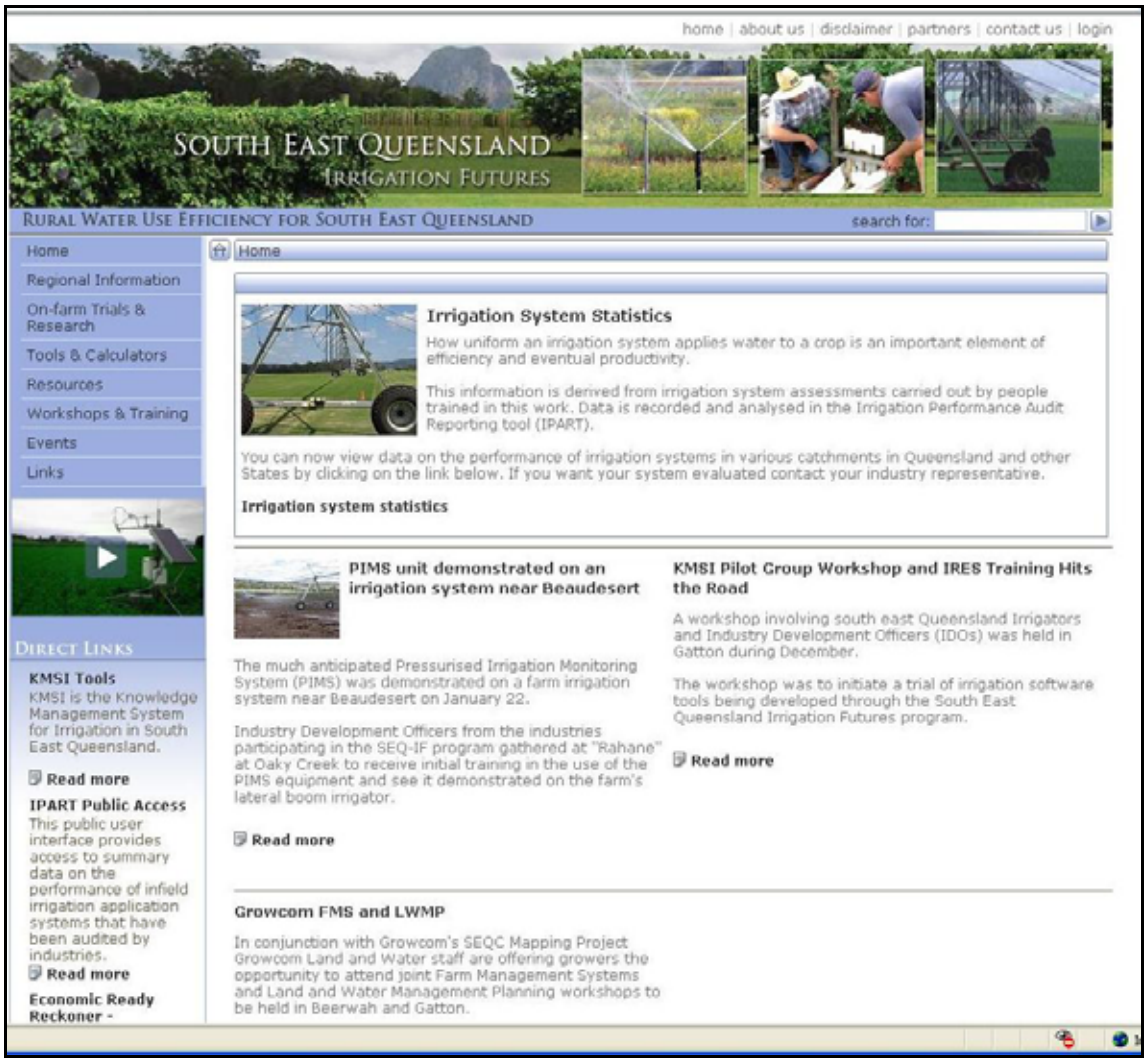
Water Resource Info Tool

Water information home page

The Water Resource Info Tool <http://www.kmsi.ncea.biz/> consolidates information used by irrigators such as rainfall, ET, commercial storage levels, surface water and ground water information in a single location. Information publically available via the web and from a range of organisations is presented to irrigators by the Water Resource Info Tool.

SEQ-IF website

SEQ-IF website home page



The SEQ-IF website <www.seq.irrigationfutures.org.au> has been developed to make accessible information such as reports, tools and calculators and links to other sites that are relevant to irrigation in south east Queensland. The website has been provided for knowledge brokers, irrigators and other individuals and organisations with an interest in irrigation in south east Queensland.

References

Australian Bureau of Statistics (2009), *4618.0 Water Use on Australian Farms, 2007–08*

Australian Bureau of Statistics (2004), *4610.0 Water Account Australia, 2004– 05*

Barraclough & Co, National Centre for Engineering in Agriculture, Dalton P (2000), Audit of Water and Irrigation Use Efficiencies on Farms within the Queensland Lucerne Industry

Barraclough & Co, National Centre for Engineering in Agriculture, Agtrans Research, Hearn B (1999), *Audit of Water and Irrigation Use Efficiencies on Farms within the Queensland Horticultural Industry*

Bennett C, & Rockwell K (1995) *Targeting outcomes of programs*

Cerdan-Infantes, Maffioli A, Ubfal D (2008) *The Impact of Agricultural Extension Services: The Case of Grape Production in Argentina*

CSIRO 2001, *Climate Change—Predictions for Australia*

Cooley H, Christian-Smith J, Gleick P (2008) *More with Less: Agricultural Water Conservation and Efficiency in California*

Coutts J & R (2003) *Evaluation of the Rural Water Use Efficiency Initiative Adoption program*

Coutts J (2005), *SEQ Water Use Efficiency, Funding and delivery framework*

Dalton P, National Centre for Engineering in Agriculture (2000), *Audit of Water and Irrigation Use Efficiencies on Farms within the Queensland Dairy Industry*

Goyne PJ, McIntyre GT, Spragge AL (2000), *Cotton & Grain Industries Stocktake Report*

Hanson JC, Just RE, Lainez JR *Evaluating a Publicly-Funded, Privately-Delivered Agricultural Extension System in Honduras*

Murray P (2000) *Evaluating participatory extension programs: challenges and problems* Australian Journal of Experimental Agriculture, CSIRO Volume 40, 2000

Poling RL (1999) *Evaluating Extension Program Outcomes* Agricultural Extension Service, Institute of Agriculture, University of Tennessee

Raine SR & McHugh AD, *South East Queensland Irrigation Futures Annual Report,* June 2009

Raine SR & McHugh AD, *South East Queensland Irrigation Futures Annual Report,* June 2008

Ridge Partners (2004), *Rural Water Trends and Issues in the SEQROC Region*

South East Queensland Healthy Waterways Partnership, *South East Queensland Healthy Waterways Strategy 2007-2012*, August 2007

Technical Report, *South East Queensland State of the Region 2008*

Tilley L, Chapman L (1999), *Benchmarking Crop Water Index for the Queensland Sugar Industry*

Watts P, Baker K, Barker S, Heinrich N, Nielsen W, McKeering L, Schmidt E (2008), *Regional Statistics Collation and Benchmarking, South East Queensland Irrigation Futures*

Watts P, Fenwick R, Crossley R, Wiedemann S, Schmidt E, *Knowledge Management System for Irrigation in South East Queensland - Implementation Plan and Strategies,* October 2006.