Queensland Government
Department of Primary Industries

RURAL WATER USE EFFICIENCY INITIATIVE

MILESTONE REPORT

Dairy and Lucerne Industries Adoption Program

"Irrigation for Profit"

June 2003

RURAL WATER USE EFFICIENCY INITIATIVE

DAIRY AND LUCERNE ADOPTION PROGRAM

FINAL MILESTONE REPORT

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June 2003

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Milestone Report June 2003
Dairy and Lucerne Adoption Program (Irrigation for Profit)

Executive Summary

All program milestones set for 2002/2003 have been achieved.
(All contracted targets for this adoption program have been met and excelled on.)

Queensland Department of Primary Industries (DPI) Agency for Food and Fibre Sciences' Intensive Livestock Dairy Program is undertaking a water use efficiency project titled "Irrigation for Profit": A program to improve water use efficiency and profit in the Dairy and Lucerne Industries. This program is being conducted in partnership with the Queensland Dairyfarmers Organisation (QDO) and in cooperation with the Department of Natural Resources and Mines (DNR&M) through its Rural Water Use Efficiency Initiative (RWUEI).

The major targets for this dairy and lucerne industries RWUE adoption program are:

- 11% and 6% (achieved 14% and 9%) water use efficiency (WUE). This has been achieved and excelled on by a combination of increasing production from irrigated pasture/crops/lucerne and reducing water use.

- Best management practice (BMP) gains of 40% (jointly/both programs 45.5%) over the three-year life of this program. A proactive education extension program covering the state of Queensland has achieved this.

- Cultural change has been indicators are developed on in this text and the program has gained a significance of 72% (participation and awareness across both industries).

The program has industry ownership/partnership through the Queensland Dairyfarmers Organisation (QDO). It is being supervised by and takes direction from a consultative committee with QDO organisational representation NR&M, DPI stakeholders and dairy consultants. DPI has been contracted by QDO to deliver these programs.

Information collected in this summary and report represents irrigation specific data from the five dairy regions state wide (Tablelands North Queensland, Central Queensland, Wide Bay and Burnett, Darling Downs, South East Queensland) and the three major lucerne-growing regions (Biloela/Central Queensland, Lockyer Valley/Moreton, Texas/Inglewood).

Issues
2002/2003 year has seen a major drought throughout Queensland and below normal use of irrigation water due to most systems (river/stream and aquifer) being closed for irrigation (at least severely restricted). It is from the programmed water scheduling knowledge of both crop and soil requirements that has been overcome many problems associated with this drought. The potential gains in a normal rainfall year would have given industry greater gains in productivity growth.

It is from the hard work (education program) of 'Irrigation for Profit' staff statewide that production has been maintained and gains have occurred. As well as the two years

previous information and communication program of issue based workshops and media information from demonstration farms that have culminated in our positive program results.

At the onset of this project data showed 1600 dairy farms in Queensland utilising 300,00ML. Due to the effects of deregulation and drought Queensland has 1150 dairy farms currently, a loss of 28%. It is estimated the dairy industry would therefore reduce its water requirements by approximately 28% to 216,000ML for irrigation, 11% WUE = 23,760ML. If we used the value of 14% WUE savings across 300,000ML usage then our savings in volume to the state would be 42,000ML.

The potential gains could realistically be doubled in time if this program was extended and would benefit rural community and urban development, urban commodities (growth in) and the state economy.

Reduction in staff towards the end of this program meant that activities needed to be more structured and focused on greatest opportunity for increases. Some preferred activities were curtailed for logistic reasons.

Gains (Targets) achieved are:

Dairy industry **14%** Water Use Efficiency
Lucerne/Pasture industry **9%** Water Use Efficiency

Dairy Industry **49%** Best Management Practice
Lucerne Industry **42%** Best Management

Table 1: Estimated water savings Dairy Industry (ML) (14%)

Level of contact	How Measured	Examples	No. Farms	Confidence level - water saving (+/-%)	(WUE) Water saving & Productivity Gain (ML)
High	Measured recorded data	Demo. farms W'shops , System Checks , "1 to 1"	226	5	20340
Medium	Accurate estimates from collected data	FIS F'days, F'walks, Awards	212	15	8480
Low	Subjective Professional Appraisal	Phone, fliers, all media, mailouts	108	25	1620
Nil	Little contact	Possibly little change, third party reports	14	80	140
Total			560		*30,580

* This total figure is a composite of direct irrigation reduction of 4% and increased production of 10% for existing water use in a normal year. During 2002/3 many produces were reduced to irrigation levels of less than 50% of their yearly quota supply.

- With the established strong (historic) communications that has existed with the DPI and the Queensland Dairy Industry all dairy irrigators have gained information and contact from RWUE staff. This report uses the base of 300,00ML of irrigation supply water to the Dairy industry prior to starting our program. Then calculates reduction in dairy farmer numbers to current levels of 1150 and excludes the irrigation farms and irrigation water lost to industry from this. Assuming current usage of Qld industry of 216,000ML.

If this data collected (WUE) is calculated using the value that Independent private consultants Barraclough place on a ML of water ($4900/ML) from their audits of 2000, then the value to the economy in savings equals $149.8 million.

Table 2: Estimated water savings Lucerne Industry (ML) (9%)

Level of contact	How Measured	Examples	No. Farms	Confidence level - water saving (+/-%)	(WUE) Water saving & Productivity Gain (ML)
High	Measured recorded data	Demo. farms (11) W'shops (27), System Checks (93), "1 to 1"(22)	153	5	5040
Medium	Accurate estimates from collected data	FIS(101) F'days, F'walks,(72) Awards(10)	183	15	4410
Low	Subjective Professional Appraisal	Phone, fliers, all media, mailouts	70	25	2520
Nil	Little or no contact	Possibly little change, third party reports	48	80	630
Total			454		12,600

Notes: Water savings (ML) calculated using Barraclough's 1997 production baseline figure of 453,000 tonne x conf. level x % total farms x 0.13 ML/tonne (which is the average WUE improvement of our demonstration farms over the 1997 WUE of 0.69 ML/tonne) equals 47,288ML. So potential for further improvement is considerable up to 34% of the elite best practice in industry.

- Our current databases only account for 454 lucerne produces in Queensland and not 1600 as per ABS. This is noted in detail in this report. This report uses the base of 140,00ML of irrigation supply water to the Lucerne industry prior to starting our program.

Best Management Practice

The 'Irrigation for Profit' team have been addressing Best Management Practice (BMP) for the dairy and irrigated pasture/lucerne industries with the aid many tools. One of which is the Dairying Better and Better project. To date 45% of dairy irrigators have participated in workshops introducing the Dairying Better and Better decision support CD. On farm systems checks, conducted on 18% of farmers, directly measure current performance practice as well as BMP and recommend improvements. Revisiting these farms has shown improvements in system knowledge and WUE on farm. The following tables provide a summary of farmer involvement BMP.

Table 3: WUE Best Management Practice in Qld. Dairy Industry (49. 27%)

Level of Contact	No. Farms 560	Confidence level (+ /- %)	% Adopting BMP (Farms)
High	226 (40.4%)	5	65 (146.9)
Medium	212 (37.8%)	10	50 (106)
Low	108 (19.3%)	20	2 (21.6)
Little	14 (2.5%)	80	1 (1.4)

Table 4: WUE Best Management Practice in Qld. Lucerne Industry (42. 51%)

Level of Contact	No. Farms 454	Confidence level (+ /- %)	% Adopting BMP (Farms)
High	153 (34%)	5	60 (91.8)
Medium	183 (40%)	10	50 (91.5)
Low	70 (16%)	20	15 (10.5)
Little	48 (10%)	80	0

- BMP is intended to mean adoption of scheduling practices, and/or recording irrigation, rainfall and hay/pasture production, and managing for agronomic and economic WUE; with a significant change in past practice.

Cultural Change is demonstrated by indicators of awareness (% of producers who have project understanding and involvement). Coutts & Russell p12, 2001. To this we have achieved greater than 70% gains with our industry irrigators across this program.

To the year ending June 2003 the project has had 72% participation of irrigators in extension activities including field days, workshops and farm visits, 18% who have had their irrigation systems audited for Distribution Uniformity (DU%), pumping costs ($/ML) and application rate, and 42% who have used the Financial Incentive Scheme (FIS), phases 1-3, to make improvements to their irrigation efficiency. (Note phase 4 has been fully allocated but monies are not available to farmers until mid July 2003, hence phase 4 calculations are not included in this data). In the dairy industry every farmer has been sent publications containing in depth case studies of farmers improving their water use efficiency. This change has developed through:

- An awareness campaign to publicise the benefit and costs of irrigation systems and management practices which improve WUE;
- Developing a Communication Plan to focus communication with irrigators, suppliers, information providers and other stakeholders; and
- Developing links with other industry RWUE adoption programs
- Farmer issue based workshops eg soils, scheduling, crop water use, irrigation water distribution uniformity
- Farmer irrigation study tours interstate and statewide

Fielddays gave us plenty of interaction, participation. They presented opportunities for knowledge gain and awareness, which grew into positive Management Changes

Dairy/Lucerne RWUE Adoption Program Report

The Dairy and Lucerne adoption program has been addressed by the 'Irrigation for Profit Team' in a manner and context that we consider seeks out methods to encourage sustainable and ecological development on farm. Encouraged by a joint partnership with industry. We have always sort methods that develop "sustainability positive ecology" and have aimed to increase productivity, profitability while meeting the project goals of improved 'Water Use Efficiency', 'Improved Best Management Practices' and desirable social outcomes for the rural community.

Overall Industry Context

- The success of the RWUE project statewide is continuing despite the worst recorded weather conditions being experienced. 2002/2003 year has seen a major drought throughout Queensland and below normal use of irrigation water due to most systems (river/stream and aquifer) being closed for irrigation (at least severely restricted). It is from a educational context, extension methods, of farmer training in programmed water scheduling knowledge of both crop and soil requirements that adversity has been overcome. In a normal rainfall year would have the potential for greater gains in productivity.

- Water restrictions are becoming more of a norm than the exception statewide this year. For example Wide Bay Burnett have faced restrictions on the Mary River at 25% of allocation with most farmers facing the prospect of using all of their allocation before the end of October last year. The irrigators association have negotiated that water be released from the Baroon Pocket Dam which is currently at reasonably high levels. This, however, will cost farmers approximately $85 per ML. The work that the Irrigation for Profit WUE officers have conducted during the project is of enormous relevance to farmers facing this situation. Through adopting a participative approach, the project has had an extensive positive impact across industry.

- The drought conditions of 2002/3 have severely hampering normal farm operations and irrigation is being used more strategically. This strategic use has been in the forefront of discussions with farmers. Using limited water to maintain pasture and crop life with modified farming practices. The dry weather conditions coming in winter has prevented some plantings, this is extremely serious for an industry based on a pasture/crop production system. Outlook for irrigation and production in irrigated areas is severely reduced. Most irrigators in the dairy and beef pasture industry have gone into survival mode. Irrigation is lower on the priority list due to water restraints and dropped bore levels have stopped many irrigators. Many farmers acknowledge efficiency and BMP as significant issues but survival of life on the farm is taking all the financial resources left to them. Irrigation improvement is taking a second place to bread and butter on the table.

    - The headwaters of southeast Queensland's major rivers have been reduced to a trickle during what is usually one of the region's wettest months. Even the Brisbane and Stanley rivers, which supply almost all of Brisbane's water, are

barely flowing in the upstream reaches above the Somerset and Wivenhoe dams. (*Courier-Mail* p3 28/1)

- Farmers are selling off even larger numbers of livestock amid fears the drought will extend for a second year. Meat and Livestock Australia (MLA) said yesterday that many farmers in NSW and Queensland could be facing a disaster if they did not get any rain in the next five weeks. (*Sydney Morning Herald* p6 25/1)

- The dry weather is causing major problems. Some farms do not have any stored water at the start of the spring season to establish any crops this will also mean a high cost to dairying in purchasing feed off farm. This feed shortage problem is compounded by a general trend to increase stocking rates to remain viable in a deregulated market. Lucerne production is at a premium but for how long is the question, considering water restrictions and bores are dropping significantly state wide.

- Localized coastal rain from cyclone Beni did relieve some pasture irrigation areas but seems to be missing many of the dam catchments areas. No significant water reached most of the Darling Downs and Burnett regions. There has been good pasture rains from CQ to the Downs (more recently) that has given many producers hope. But follow up rain in needed.

- If just overcoming deregulation has not been enough mixed up with the drought with many farmers just starting to get their farms back on track financially. Income has suddenly reduced to many of Queensland dairy farmers as Queensland's major cooperative reduced milk income to its farmers by up to 3 cents/litre.

- Some local farmers have told staff that the current price drop in milk income calculates to $1500.00 plus loss per month ($18,000/year) in farm income, to some even more. Many will find it difficult to cope with this type of reduction in income.

Industry RWUEI structure (Year 3)

During 2002/3 year
Tim Biggs has been appointed to Toowoomba dairy RWUE group to continue on from Caroline Biggs as extension officer on the Darling Downs. Two more staff are waiting opportunities to gain other positions as this project in its final year. I have three staff looking at options for jobs, as all are aware that the DPI will not carry on tenure if no outside monies can be found after project funding finishes. Moral is lower than it has been as these dedicated officers would like to be continuing on in there current roles. Discissions on a follow up program have not proceeded sufficiently to provide hope of a continuation of the project.

Brad Silver (North Queensland) left as at 1st of January and taken up employment with Dairyfarmers co-operative in the Hunter region of NSW. Mervyn Jessen (Gympie) has left as at 31st of January and take up a position with the Irrigation Association of Australia. These positions were not replaced and existing staff covered their responsibilities statewide. Finding able trained staff at this late stage in the project is extremely difficult for a short tenure life of less than six months.

Che Murray (Mutdapilly) moved on to another departmental position in May. Tim Biggs left the program on the 30th of May. Scott Wallace gained a newly created position with QFVG in Gatton in June.

- The program has industry ownership through the Queensland Dairyfarmers Organisation. It is being supervised by and takes direction from a consultative committee (steering group) with QDO organisational representation, NR&M, private industry consultants, DPI stakeholders and dairy consultants. This group met on six occasions through the duration of this year and have done so in previous years.

Social Indicators (awareness/participation)

Farmers leaving the industry as a result of deregulation and lack of irrigation water in drought conditions have slowed progress. At the onset of this project data showed 1600 dairy farms in Queensland utilising 300,00ML. Due to the effects of deregulation and drought Queensland has 1150 dairy farms currently, a loss of 28%. It is estimated the dairy industry would therefore reduce its water requirements by approximately 28% to 216,000ML for irrigation, 11% WUE = 23,760ML. If we used the value of 14% WUE savings across 300,000ML usage then our savings in volume to the state would be 42,000ML.

Our current databases only account for 454 lucerne produces in Queensland and not 1600 as per ABS. It is often hard to find exactly where lucerne producers may be, as they do not have any formal organisational body unlike Queensland dairy farmers, QFVG or the Sugar Industry. Statical reports that record information about this industry only ask to tick a box if you grow lucerne this could amount in many cases to a small amount of mixed pasture with less than 5% lucerne content. Some growers also use lucerne as a rotational agronomic tool in other cropping situations and do not necessarily grow any significant amount for any significant time. The database we have (uses) for this study includes significant commercial enterprises in lucerne growing. This has been constructed from internal (Departmental) information acquired from research and extension agronomists statewide.

The project has been heavily involved with the launch of the Dairying Better ‘n’ Better decision support CD, which contains major sections on irrigation, fertiliser and effluent management. We have been supporting the development of this CD by providing benchmarks, rules of thumb and system checking processes. This has involved eleven field days covering all dairy areas of Queensland in March. An evaluation of these workshops revealed 67% of participants wanted more training on irrigation system improvement and management, with their preferred process being with smaller groups focusing on skills training. Feedback from Lucerne grower meetings during this time support focusing on skills training as well. This information was embraced by our group and acted on in all regional areas. Consequently issue based workshop went statewide. North Queensland farmers wanted more systems audits and this was arranged by funding the North Eacham and Johnson Landcare group for a casual staff person to do this.

We are continuing to get monthly case studies published in the Dairy Times. This new publication has received a very positive response from the dairy farming community. Monthly articles go to all dairy farmers in their QDO newsletter. Articles have been in many regional papers (inc QCL) advertising lucerne and dairy workshops. Our group (Irrigation for Profit) have a conference call once per week.

The Irrigation for Profit team have developed a website hosted by QDO 'Irrigation Update'. This website enables producers to gain information in the form of short notes in a particular area of irrigation management. Che Murray (Mutdapilly) is the web master looking after the data and responses and Adrian Pratt QDO is maintaining all technical (Web) with the site.

The Dairy and lucerne team was well represented with papers presented at the R&D and E&A Workshop 8-9 April run by NR&M.

Malcolm Martin was a keynote speaker at the 2nd International Water Resources Conference in Las Palmas, Grande Canaria on the 30th of April. The Paper is titled: Rural Water Use Efficiency: a major key to increase production and reduce the burden on our valuable water resource. It was noted by the discussion that this RWUEI program (model) is unique in world standards in cooperation in water resource management.

During mid November a group of 20 farmers embarked on a farm study tour through the central farming districts of NSW. The study tour, organized by the Irrigation for Profit Team, travelled through the Hunter and Kangaroo Valley areas, visiting a mix of dairying irrigation operations.

Irrigation water availability was an outstanding feature on most farms. The water supply was critical for the high stocking rate system to operate effectively. The irrigation systems observed included centre pivots, rotating boom, lateral move, hand shift pipes, flood, travellers and bike shift (ezi-shift). Additionally, one unique machine was designed to operate as both a pivot and lateral move irrigator. Centre pivot applications were generally between 20 – 25 mm every four days during the warmer months. Pastures under this management system were of excellent quality and yield. Farms using boom irrigators were applying about 50 mm in one pass; the rotation time was varied depending on the irrigation area.

Evaluation of these farm educational tours after time (3-6mths) back at home have shown that over 65% of farmers have made significant changes in management practices as a direct result of knowledge acquired on these tours.

North Eacham and Johnston River Landcare group (NQ) were funded from our RWUE monies as an officer present was reduced. From work they had previously done they considered that the continuation of irrigation system audits would bring about the most change in local BMP. Monies were also funded for a degree-day irrigation trial on local farms (report on this in regional reports appendix 4).

- In summary the Irrigation for profit team has mediums used of:
    - Demonstration farm sites
    - Field days
    - Farm walks
    - One to one irrigation system audits (Testing current equipment)
    - Issue based workshops
    - Farm tours
    - Seminars
    - Road shows

- Newsletters & Fliers
- Media releases
- Discussion groups
- Awards Program
- Benchmarking
- Given farmers equipment to experiment with
- Gained specialist services as required to aid field officers and farmers
- Developed benchmarks (with D B & B)
- Made strong linkages to other RWUEI adoption programs
- Developed regional data from Demonstration sites
- Strong linkages to Dairy R & D program at Mutdapilly
- Linkages to other extension programs
- Have regular team meetings and phone hook-ups
- Have a reference group committee
- Irrigation farm planning advice
- Our Irrigation web site

For timetable of example Activities for 2002/3 see appendix 1

Best Management Practice

Dairy Industry **49%** Best Management Practice
Lucerne Industry **42%** Best Management

The Irrigation for Profit team have been addressing Best Management Practice (BMP) for the dairy and irrigated pasture/lucerne industries with the aid many tools. One of which is the Dairying Better and Better project. To date 45% of dairy irrigators have participated in workshops introducing the Dairying Better and Better decision support CD. On farm systems checks, conducted on >20% of farmers, directly measure current performance practice as well as BMP and recommend improvements. Revisiting these farms has shown improvements in system knowledge and WUE on farm. The following tables provide a summary of farmer involvement BMP.

Table 5: WUE Best Management Practice in Qld. Dairy Industry (49. 27%)

Level of Contact	No. Farms (560)	Confidence level (+ /- %)	% Adopting BMP
High	226 (40.4%)	5	65 (146.9)
Medium	212 (37.8%)	10	50 (106)
Low	108 (19.3%)	20	2 (21.6)
Little	14 (2.5%)	80	1 (1.4)

Table 6: WUE Best Management Practice in Qld. Lucerne Industry (42. 51%)

Level of Contact	No. Farms (454)	Confidence level (+ /- %)	% Adopting BMP
High	153 (34%)	5	60 (91.8)
Medium	183 (40%)	10	50 (91.5)
Low	70 (16%)	20	15 (10.5)
Little	48 (10%)	80	0

BMP is intended to mean adoption of scheduling practices, and/or recording irrigation, rainfall and hay/pasture production, and managing for agronomic and economic WUE; a significant change in past practice.

Data was collected from each region by project officers this data was brought together at a strategic planning workshop and the above results obtained.

###Explanation of Table 5

All irrigated farmers in were placed into categories representing their level of contact with the RWUE project. From this process it was clear that 226 (40%) farmers were involved in a high level of contact (this includes demonstration farms, system checks etc), 212 (37%) were involved in a medium level (FIS, awards etc), 108 (19%) were involved in a low level way (media, phone etc) and 14 (2%) had little contact or mail outs only. These figures were then further developed to identify the percent of farmers who had adopted Best Management Practices.

Of the farmers involved in a high level of contact it was determined that approximately 65% had altered their irrigation management and adopted BMP. It was determined that 50% of farmers involved in a medium level of contact had also significantly altered their irrigation practices and 2% at a low level had adopted significant BMP change. From the farmers involved rated at little level of contact 1% were expected to have adopted BMP. These figures result in a BMP adoption level of 49% for the dairy industry farmers in Queensland. (This same process was used also for the lucerne industry, table 6).

If there has been any reason for the program not influencing more irrigators in the adoption of BMP it has been the climatic conditions and subsequent financial restrictions. As stated by one farmer “we know when we should be irrigating (from Enviroscan data) but we simply do not have the water resources to do so (during drought)”. Currently farmers can only irrigate when water is released from the dams and they only have a set window of time to pump from the river. If they do not have on farm water storage, their irrigation scheduling is completely based on outside factors, not the crop water requirements.

“With scarce water allocations we need to decide if we should reduce our irrigated area and water it properly, or keep the same area and hope it rains”. This is the question currently facing many dairy farmers, and other irrigated farmers across the state.

The project has been heavily involved with the launch of the Dairying Better ‘n’ Better decision support BMP CD, which contains major sections on irrigation, fertiliser and effluent management. We have been supporting the development of this CD by providing benchmarks, rules of thumb and system checking processes. This has involved eleven field days covering all dairy areas of Queensland in March.

Over 350 irrigation system audits were conducted statewide across both industries. These audits let us acquire baseline data to aid us in judging improvements in BMP on farm statewide. Officers went back to these farms and could easily judge via rechecking if management practices had changed. The utilisation of measured data in water use, pumping rates, distribution uniformity and scheduling practices.

The Financial Incentive scheme data is also a significant aid in knowledge and skill/management change. From simply repairing leaking mains farmers saved in some cases 40ML/yr compared to previous years. Farmers knew a problem existed, but not to what measured effect (loss) this was till this program encouraged knowledge acquisition in this area. See FIS appendix 2 for detailed information.

Larger changes came from complete system changes. From high-pressure travellers to low-pressure centre pivots. Farmers invested over $100,000 in these systems per farm acquisition.

See reports on farms BMP improvement and award program in Case studies Appendix 5

Water Use Efficiency

Dairy industry **14%** Water Use Efficiency

Lucerne/Pasture industry **9%** Water Use Efficiency

Table 7: Estimated water savings Dairy Industry (ML) (14%)

Level of contact	How Measured	Examples	No. Farms	Confidence level - water saving (+/-%)	(WUE) Water saving & Productivity Gain (ML)
High	Measured data	Demo. farms W'shops , System Checks , "1 to 1"	226	5	20340
Medium	Accurate estimates	FIS F'days, F'walks, Awards	212	15	8480
Low	Subjective Professional Appraisal	Phone, fliers, all media, mailouts	108	25	1620
Nil	Little or no contact	Possibly little change, third party reports	14	80	140
Total			560		30,580

With the established strong (historic) communications that has existed with the DPI and the Queensland Dairy Industry all dairy irrigators have gained information and contact from RWUE staff.

Table 8: Estimated water savings Lucerne Industry (ML) (9%)

Level of contact	How Measured	Examples	No. Farms	Confidence level - water saving (+/-%)	(WUE) Water saving & Productivity Gain (ML)
High	Measured data	Demo. farms (11) W'shops (27), System Checks (93), "1 to 1"(22)	153	5	5040
Medium	Accurate estimates	FIS(101) F'days, F'walks,(72) Awards(10)	183	15	4410
Low	Subjective Professional Appraisal	Phone, fliers, all media, mailouts	70	25	2520
Nil	Little or no contact	Possibly little change, third party reports	48	80	630
Total			454		12,600

Notes: Water savings (ML) calculated using Barraclough's 1997 production baseline figure of 453,000 tonne x conf. level x % total farms x 0.13 ML/tonne (which is the average WUE improvement of our demonstration farms over the 1997 WUE of 0.69 ML/tonne) equals 47,288ML. So potential for further improvement is considerable up to 34% of the elite best practice in industry.

Our current databases only account for 454 lucerne produces in Queensland and not 1600 as per ABS. This is noted in detail in this report.

This report uses the base of 140,00ML of irrigation supply water to the Lucerne industry prior to starting our program.

###The data involved in recording of WUE was gathered together in the same methods as in BMP above. With the WUE data we also looked at recorded efficiency of production on farm across seasons, crops and pasture types irrigated within the regions and state. We used demonstration farm data water use and data collected from statewide system audits of irrigation plants.

A survey (in 2002) of 500 farmers who have made changes through involvement with the project has shown an average of an 8.7% improvement in water use efficiency across the dairy and lucerne industry in 2002. Our on farm demonstration sites have measured up to 30% reduction in water used to grow the same amount of feed. This has mainly been achieved by:

- Improving the DU% of the irrigation system and accurately measuring application amount.
- Using scheduling tools to manage frequency and volume of irrigation events.

50% of these farmers were revisited in 2003 and a 15.1% improvement in water use efficiency across the dairy and lucerne industry was established from these farmers.

Demonstration site information case studies and farmer learning's see appendix 5

For FIS results that effect BMP (in detail) see appendix 2

Other impacts

The program has been well funded and as a factor of this achievements have been made of significant consequence. The parameters of WUE, BMP and positive social change required. The program having going through a severe drought year has shown what can still be achieved.

By the end of the first year of the program it was noted by all members of the Rural advisory committee that a follow up or continuation of this adoption and FIS would benefit rural industry and continue on with even more gains in WUE and BMP. This issue met with many bounces in the management process and Government and as yet no program will be running after 30 of June 2003. This is of great disappointment to industry and the dedicated staff that are involved the programs. Finding trained dedicated staff is not an easy process and often takes months if a new program is again commenced.

There has been a great opportunity lost in a non-continuation of this program from the 1st of July and it is possible that without maintained momentum that gains so hard worked for may be lost or at least reduced. It seems ironic at least that this extremely positive government program so heavily invested in by many may have set backs due to non-continuation from July 1.

Funding for this Dairy and Lucerne adoption program of $2,032,109.00 came from NR&M Funding for this program of $435,000 came from DPI. Funding for this program of $100,000 came from other third parties

Total FIS funding gained in the first three released phases to the dairy/lucerne industry amounted to $1,662,375.

Industry has also invested $3 to every $1 of government monies in the first 3 phases of the FIS. Phase 4 data on hand indicate that when monies are released next month this may be as high as $6 to $1.

Issues and Learning's

Also see case studies in Appendix 5

It has taken a considerable effort to gain respect of industry without them thinking you are present as a regulator rather that an advisor, within the program a loss of this consistency may again mean that staff will have to build bridges, which is a time consuming job and greatly slows down adoption practices.

Shortage of capital ($ on farm) for irrigation updating or repairs, and of irrigation water itself, as a result of drought, continue to limit adoption at this present time. We see that the Financial Incentive Scheme has and will continue to play a vital part in the adoption process. The financial incentive scheme provided an opportunity that many farmers took to be able to increase water use efficiency. Many invested at a ratio of at least 3 to 1.

The lucerne hay industry is completely unregulated and unorganised. There is no R&D levy imposed as in other industries. Lucerne growers generally regard themselves as being in direct competition with each other. This limits the effectiveness of modern extension methods because of growers' reluctance to share experiences.

Workshops held to increase awareness of improving water efficiency through increased Distribution Uniformity and Pump Efficiency has been well received but there has been little interest from dairy farmers to follow this though at this time of drought. The declining water availability coupled with the increased lack of feed has given farmers little time for other activities. Financial instability due to decreased milk prices has reduced the amount of capital available for dairy farmers to expand irrigation systems.

The initial stages of the project we came with a pre-conceived idea that scheduling was the process line to take. It was only after seeing the condition of many irrigation systems that we realised that much work needed to be done it getting these systems to correct performance first before we could address scheduling in full.

Future

The program has benefited greatly by all staff and all organisations involvement addressing the issues at hand in a positive and collaborative manner. If this model is developed on any continuing program will be successful. Programs such as this need continuation and are more of a ten-year program rather than a three-year plan. This funding issue should be addressed by funding institutions in future.

Appendix 1
Activities for 2002/3

WORKSHOPS

		Involvement		
Date	**Venue & Topics**	**Officers**	**Others**	**Comments**
20.8.02	Johan & Judith Herron - Eungella * demonstration of fertigation system * efficient irrigation pump operation * use of on farm audits	Merv Jessen Che Murray Greg Stanley	2 Reps from Dowdens Pumping - Mackay	Promote demonstration site and highlight WUE issues as requested by producers
2.9.02	John & Chis Keleher –Milman *efficient irrigation pump operation * use of on farm audits	Merv Jessen Che Murray Greg Stanley Glen Chopping	Charlie Ernst (Pauls)	Highlight WUE issues and system audits as requested by producers
11.9.02	Pat & Rose Perry – Bullyard *efficient irrigation pump operation *use of on farm audits	Merv Jessen Che Murray Greg Stanley		Highlight WUE issues and system audits as requested by producers
15.5.03 16.5.03 20.5.03 21.5.03	Toowoomba DPI Mutdapilly Research Station Forestry Centre, Gympie Biloela Research Station , Biloela Topics covered at each day – crop & pasture agronomy, irrigation pumps, distribution uniformity, application efficiency, system comparison, species selection, maximising benefits of rainfall, animal production & husbandry	Ken Bullen Scott Wallace Tim Biggs Sarah Kenmen Ross Warren Warwick Waters Greg Stanley Mal Martin	Merv Jessen (IAA)	Dairy & Lucerne RWUE roadshows, highlighting practical lessons learnt in irrigation management over the years of the "Irrigation for profit Project"

MEDIA

Type	**Date**	**Topic**	**Comments**
News Release	11.9.02	Study Tour	Article appeared in all local rural papers and Country Llife, Dairy Times & QDO Dairyfarmer
Radio	17.9.02	Study Tour	Promotion of study tour to NSW on 1071 Kingaroy
Radio	18.9.02	Study Tour	Promotion of study tour to NSW on 4BU Bundaberg
Radio	13.11.02	Rural Water Manager of the Year Award	Highlighting "Rural Water Manager of the Year" award on 4BU Bundaberg
News Release	18.11.02	Rural Water Manager of the Year Award	Notification of extension of closing date for awards. Appeared in all local rural papers & Country Life, Dairy Times & QDO Dairyfarmers
New Release	3.4.03	Dairy & Lucerne Roadshow	This release highlighted the coming Roadshow. Article appeared in all local rural papers & Country Life, Dairy Times & QDO Dairyfarmer
Letter	24.4.03	Roadshow invitation Roadshow	Special letter sent to all co-operators
Flyer	28.4.03	Roadshow invitation	Flyer sent to all other producer inviting participation in Roadshow

RWUE Dairy & Lucerne, K Bullen & S Wallace
Extension Summary Table 01/07/2002 - 30/06/2003.

Activity	Date	CQ	D Downs	S E Q	Topics	Reason	Officers Involved	Other Speakers
Centre Pivot **Workshop**	2/10/02		Texas Golf Club		Design & management	Growers' request	K Bullen, S Wallace	R Sutton
System Checking **Workshop**	5/12/02		Inglewood, Yarranbrook Feedlot		Benefits & procedures	Growers' request	T Biggs, K Bullen, S Wallace	
Roadshow	15/05/03		Toowoomba DPI Conf. Centre		Project learnings	Consolidate final take-home messages	Biggs, Bullen, Jessen, Kenman, Murray, Stanley Wallace, Warren	W. Waters as facilitator/chairman
Roadshow	16/05/03			M'pilly Res Station	Project learnings	As above	As above	Che Murray as facilitator/chairman
Roadshow	20/05/03			Gympie Forestry Centre	As above	As above	As above	Ross warren as facilitator/chairman
Roadshow (planned but cancelled due to insufficient acceptances)	21/05/03	Biloela Res. Stn.			As above	As above	-	-
Roadshow	21/05/03	R'ton DPI			As above	As above	As above	Ross Warren as facilitator/chairman
Fieldday/workshop	29/05/03			Toogoolawah Buchanan's	Pumps, sched. Tools	Grower request	Bullen, Wallace	Toogoolawah Landcare group

				farm			Jessen	
RWUEAdvisory **Group Meetings**	21/8/02 20/11/02 19/02/03			DPI Brisbane	Project activities/ Achievements P' Point Presentation on 20/11		Bullen	
QDO Meetings	Three in 2002-3 to date			QDO Office, Brisbane	Lucerne project activity report		Bullen Martin Waters	
RWUE **Project Workshop No2, Brisbane.**	8-9/04/03			Bardon Prof. Centre	P'Point presentation on Dairy & Lucerne project outputs & outcomes & future recomm.	Convened by DNR & M,	Bullen	Other RWUE Project Co-ordinators, researchers, extn officers
RWUE **Team Meetings**	October, '02 and March'03			Noosa & Bribie Is..	Planning & reporting	Convened M Martin	Bullen	Whole Dairy/Lucerne RWUE project team
Media Reports	October '02			Case Study publicity - Laidley Co-operator	Media report on project successes		Bullen & Wallace	A Chamberlain, Ed., *Dairy Times*, *Gatton Star, and Rural Weekly*
Media Reports	Feb. '03		Publicity re Co-operator Case Study, Sam. Campbell				Bullen & Wallace	Toowoomba Chronicle / Rural Weekly, Warwick Daily News, Clifton Courrier.
Media Reports	March '03		Media report on			Requested by Border	Bullen	Border Rivers Newspaper, and

			farmer keenness on RWUE in Border Rivers Region			Rivers Irrigators		Rural Weekly
Media Reports	Jan/Feb, '03	Here	Here	Here	Calling nominations for *Rural Water Mgr. Of Year* Award		Bullen	G Stanley, for pub in Gatton, Toowoomba, I'wood, Biloela, Rural Weekly
Media Reports "Dairy Times", and Gympie paper	May/June '03	Here	Here	Here	Roadshow topics - RWUE project learnings	Requested by Bullen	Bullen, Wallace Biggs, Jessen, Kenman Warren	
Paper M Martin of ***Int'natinal Conf. paper*** on the Dairy / lucerne RWUE project	April '03						Martin	Canary Islands 2nd International Conference on Resource Management
Website Publications *DairyPage (QDO)*					Several *short story items* re Lucerne RWUE Project issues	QDO	Bullen Wallace	C Murray

Contact List – Tim Biggs

Field days,farm walks and meetings

Event	*Location*	*Date*	*Numbers Present*	*Staff Present & Guest Speakers*
Workshop	Warwick	4/12/02	13	Tim Biggs, Scott Wallace, Merv Jessen, Malcolm Martin
Workshop	Westbrook	11/12/02	17	Tim Biggs, Scott Wallace, Merv Jessen
Workshop	Inglewood	5/12/02	20	Tim Biggs, Scott Wallace, Merv Jessen, Malcolm Martin

Articles

Title	*Publication*	*Date*	*Focus*
How to check your irrigation system	All media outlets in dairying areas of QLD	19/11/02	Irrigation system checks

Planning Meetings

Event	*Location*	*Date*	*Numbers present*
Stategic Meeting	Noosa	15th – 16th Oct 2002	10, Malcolm Martin, Warwick Waters, Ken Bullen, Ross Warren, Scott Wallace, Greg Stanley, Tim Biggs, Ché Murray, Merv Jessen, Sarah Kenman
Stategic Meeting	Bribie Island	12th – 14th March 2003	8 Malcolm Martin Warwick Waters, Ross Warren, Scott Wallace, Greg Stanley, Tim Biggs, Ché Murray, Merv Jessen
Road show Planning	Toowoomba	7th Jan 2003	6 Malcolm Martin Warwick Waters, Ken Bullen, Ross Warren, Scott Wallace, Tim Biggs,

Staff during this time also conducted over 350 system audits of irrigation plants statewide in general it takes 1.5 days to complete each audit. These audits gave us data to analyse system improvements on farm statewide (indication of BMP improvements on farm).

Appendix 2

Financial Incentive Scheme Analysis

Overview

Dairy/Lucerne, Phases 1-3 (Phase 4 is to be released in July as such no data from this has been included)

Introduction

The Rural Water Use Efficiency (RWUE) Financial Incentive Scheme was put in place to assist farmers achieve more profitable results from existing irrigation sources. The RWUE Initiative is divided into the four major irrigation industries. These include:

- dairy/lucerne industries
- sugar cane industry
- cotton industry and
- fruit and vegetable growers

Each industry has its own process for distributing financial incentive scheme funds, and limits of financial assistance.

For dairy/lucerne enterprises, the scheme provides for 75% of purchase price up to a maximum value per farming enterprise. This maximum value per farming enterprise was initially set at $2000, however it was raised to $3000 in the second round of the subsidy.

If the ceiling per farm was not reached in the initial application, a subsequent application could be made to make up the difference. This also applies to enterprises that reached the initial ceiling of $2000. These farms could submit a further application to reach the maximum of $3000 subsidy per enterprise.

This subsidy can be used to purchase items that fit into a number of categories. These categories include:

Soil/water monitoring equipment

Irrigation systems improvements

Water meters

Consulting to assess the opportunity to improve or upgrade the existing irrigation system.

From the third round of the subsidy, farmers could also claim for irrigation system changes. If a farming enterprise wished to change from one irrigation system to a more efficient low pressure system (eg centre pivots, linear moves) they were eligible for a subsidy of 10% of the purchase price up to a maximum subsidy of $10 000.

The total amount spent on irrigation equipment through the FIS in Queensland is $5 566 260.93. Of this amount $1 494 266.26 was contributed by the FIS. This leaves $4 071 994.70 contributed by farmers.
After comparing individual purchases:

Average purchase price - $8 234.11

Average FIS subsidy – $2 210.45

Average farmer contribution - $6 023.66

Some of these purchases were for complete irrigation system changes. This data can affect the overall average as a number of farmers spent over $100 000, however could only receive a maximum subsidy of $10 000. The following table compares the averages of purchases excluding system changes, as well as looking at only system changes.

Table 1.1

	Excluding system changes	**System Changes**
Total purchase amount	$3 822 425.90	$1 743 835
FIS amount	$1 338 266.80	$155 999.4
Ave purchase price	$5 835.76	$83 039.76
Ave FIS subsidy	$2 043.16	$7 428.54
Ave farmer contribution	$3 792.61	$75 611.22

From analysing this data it becomes apparent that on average farmers are contributing almost double the amount of the subsidy towards the purchase price of irrigation equipment to improve the system. However farmers involved in a complete system change are contributing on average 90% of the costs.

Applications made for the subsidy in the dairy/lucerne industries were stored in a database to allow for future analysis. The database kept records on:

- the application date,
- region the enterprise is in,
- regime area,
- irrigation volume,

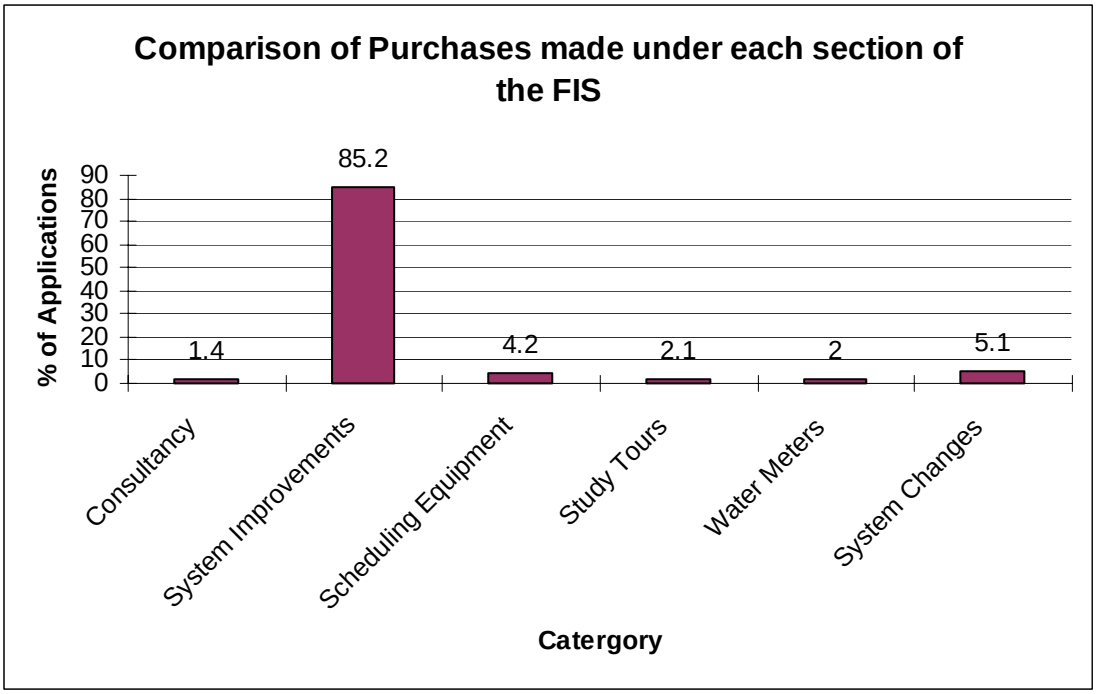
- the category (as above) the subsidy was used for,
- the proposed purchase,
- the estimated benefits, and
- other contact details.

This report analyses the data stored in the database to identify which categories were used the most, what benefits were expected and what equipment was purchased.

Purchases

Figure 1.1 compares the percent of purchases made for each category.

Figure 1.1



As can be seen, 85.2% of purchases were for equipment that would improve the irrigation system. Equipment that falls into this category includes:

- new sprinklers
- hydrants
- pumps
- underground mains
- pipes
- hoses etc

Changing to a more efficient, low pressure irrigation system was the next most common purchase with 5.1% of applications. Farmers were not able to apply for this category until the third round of the subsidy.

The remaining four categories; consulting (1.4%), scheduling equipment (4.2%), study tours (2.1%) and water meters (2%); all had a very similar number of applications.

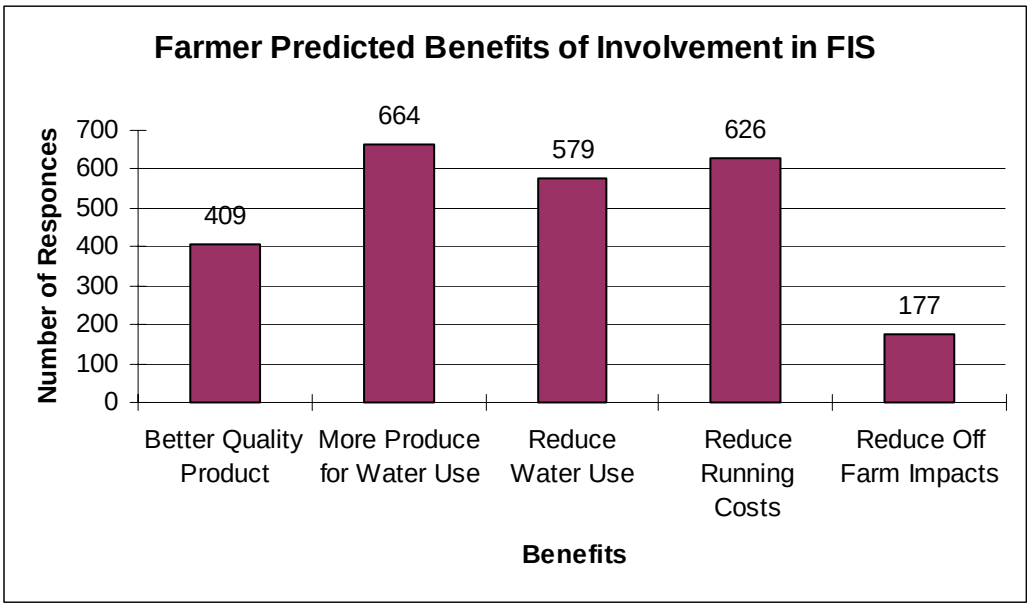
Expected Benefits

When farmers apply for the subsidy, one of the questions asks them what the expected benefits of the purchase will be. They are provided the following 5 options:

- better quality product
- more produce for water use
- reduce water use
- reduce running costs
- reducing off farm impacts

Figure 1.2 shows the number of responses for each option, for all applications. It should be noted that each application can provide more than one expected benefit.

Figure 1.2



As can be seen the three common responses were more produce for water use (664, 24%), reduce water use (579, 20.5%) and reduced running costs (626, 22%). Reducing off farm impacts was the least mentioned predicted benefit with 6% of applications. Only 409 applicants (14.5%) thought their purchase would result in a better quality product.

Comparing Purchase to Expected Benefit

This section looks at each category eg irrigation system improvements, scheduling tools etc and then examines the expected benefits predicted for that purchase. For instance, Figure 1.3 only looks at the predicted benefits highlighted by farmers who purchased irrigation system improvements.

As can be seen, more produce from water use (27%) and reducing running costs (26%) are the main benefits indicated by farmers for purchasing equipment to improve the irrigation system.

Figure 1.3

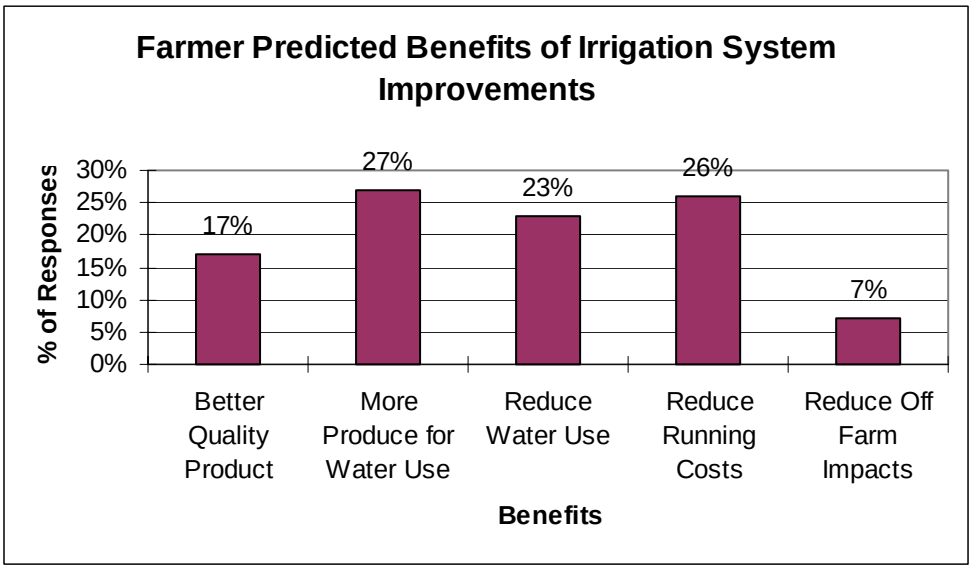
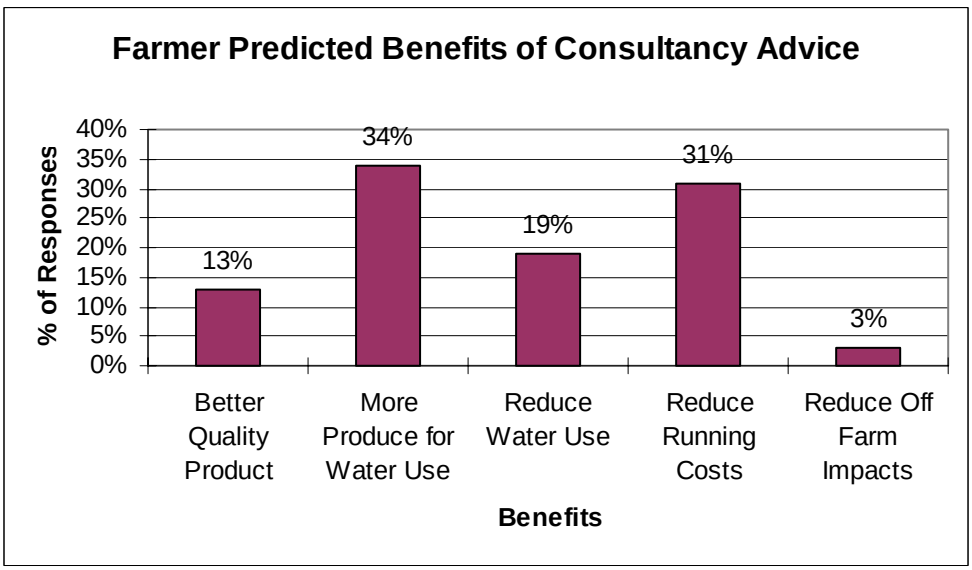


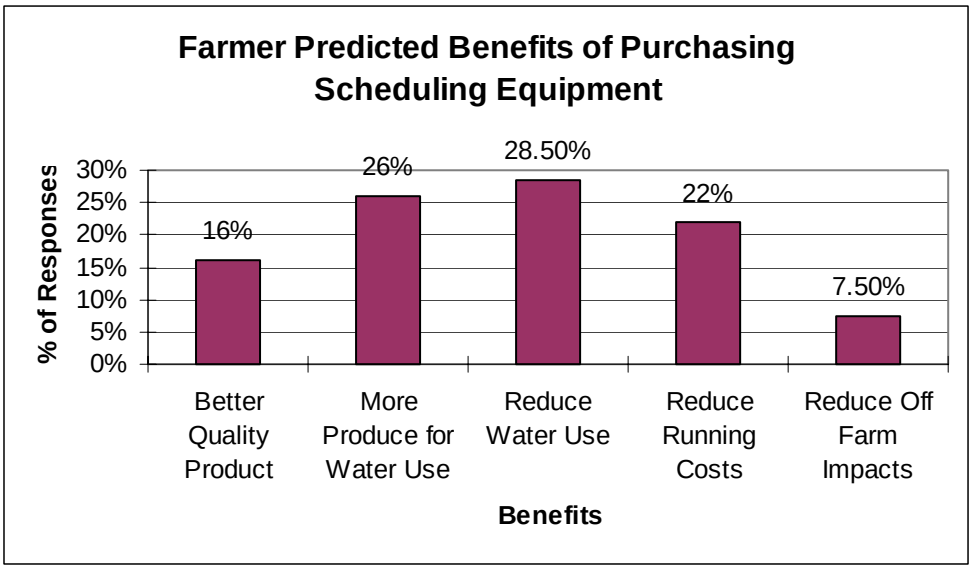
Figure 1.4 shows the expected benefits indicated by farmers using the subsidy to purchase consultancy advice. The main expected benefits of consultancy were more produce for water use (34%) and reduced running costs (31%). Only 3% of applicants indicated reducing off farm impacts would be a benefit of consultancy.

Figure 1.4



The predicted benefits of purchasing scheduling equipment are shown in Figure 1.5. The most common benefit of this category was reducing water use (28.5%).

Figure 1.5



The most common predicted benefit of involvement in study tours was more produce for water use (30%), as indicated in Figure 1.6.

Figure 1.6

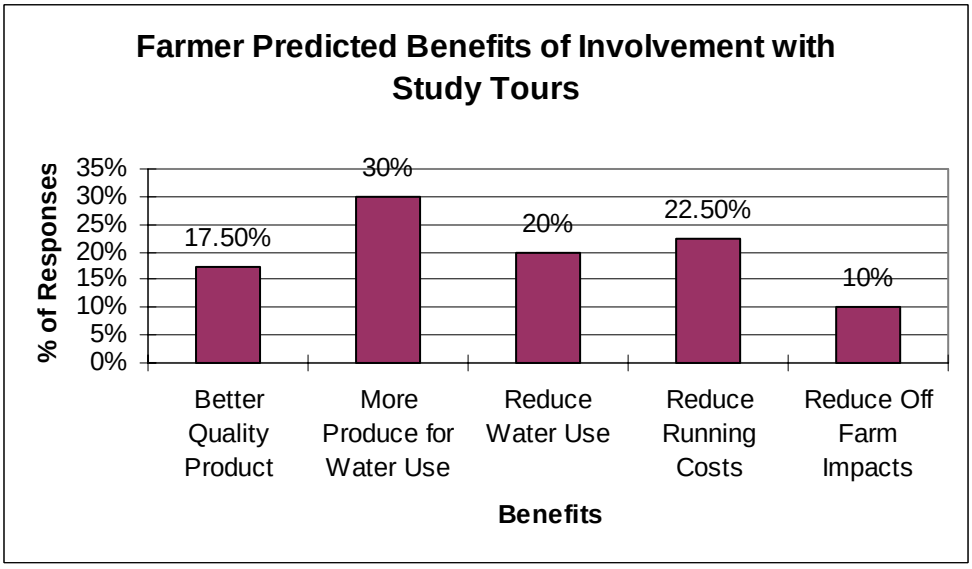


Figure 1.7 shows the predicted benefits of purchasing water meters. Reduced water use was the most common response with 38% of applicants predicting it as a benefit.

Reducing off farm impacts (15%) and producing a better quality product (2.5%) were the least common responses.

Figure 1.7

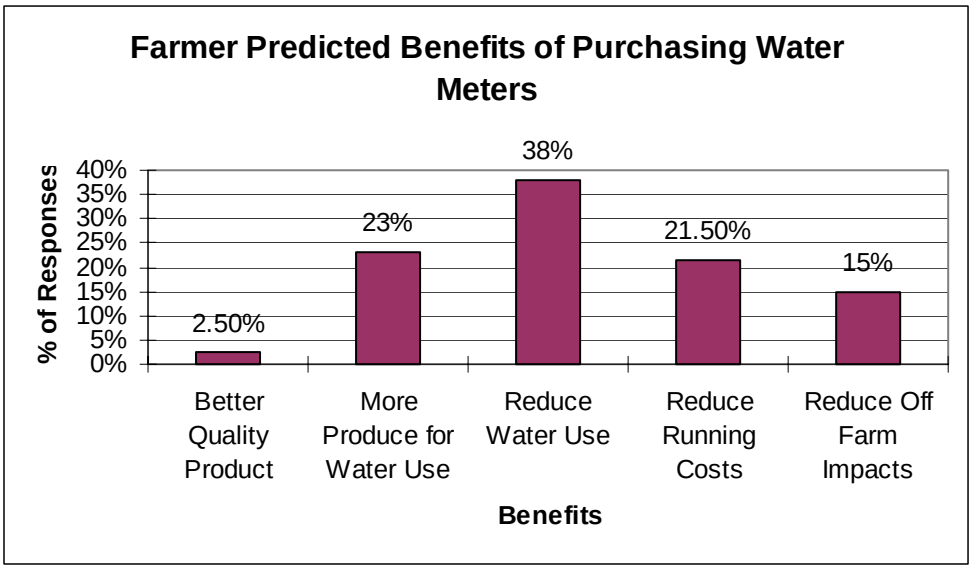
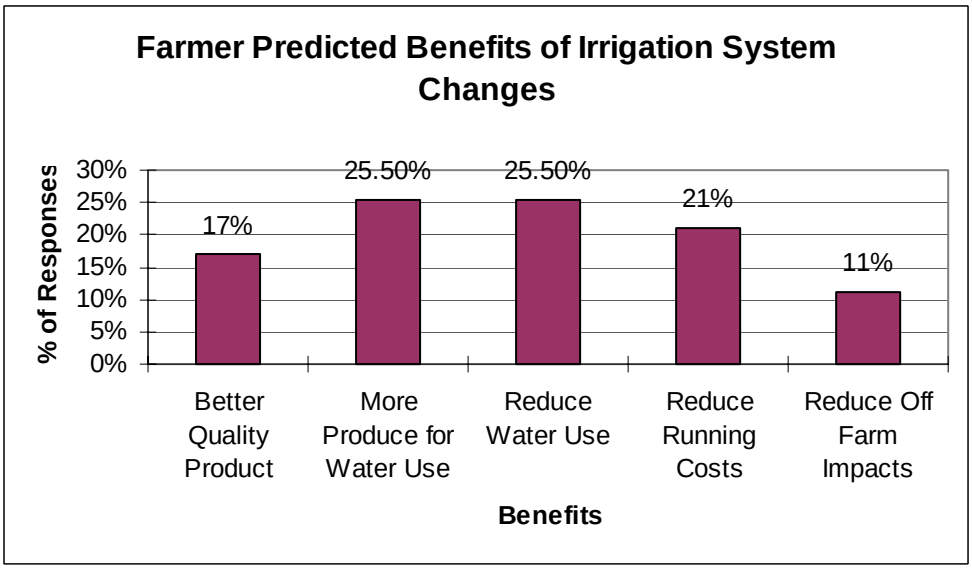


Figure 1.8 highlights the benefits farmers predicted from changing the irrigation system to a low pressure, more efficient system. As can be seen more produce for water use (25.5%) and reduced water use (25.5%) were the main benefits identified by farmers.

Figure 1.8



Conclusion

From analysing the FIS data it is apparent that the subsidy contributed to dairy and Lucerne farmers being able to purchase equipment to improve their irrigation management. The purchase of equipment, other than complete system changes, demonstrates that while the subsidy allowed for 75% of the purchase price, up to a maximum of $3 000, on average farmers were purchasing more expensive equipment and covering the cost themselves. For instance the total amount spent on irrigation equipment was $3 822 425.90 however the subsidy paid for only 35% of the cost ($1 338 266.80). The remaining 65% of the purchase price was contributed by farmers ($2 484 159.10). From viewing the phase 4 data this is expected to increase by approximately $5 to $1.

As has been demonstrated, the availability of the FIS subsidy has encouraged diary and Lucerne farmers to purchase equipment which they have predicted will improve water use efficiency and irrigation management. The farmers have also on average contributed more financially towards the equipment than the subsidy offered. Rather than limiting their expenditure to receive 75% of the purchase price from the subsidy, they have bought the equipment they needed and then received some assistance towards the purchase price.

The FIS has been well received and utilised. It has been an invaluable tool to assist farmers purchase equipment to improve their irrigation management and contribute to water use efficiency.

Appendix 3
Winning Entry Client Service Award (November 2002)

DPI 2002 Client Service Awards

Nomination: Dairy and lucerne "Irrigation for Profit Team"
<u>Category</u>: ·Support for sustainable food and fibre industry development

The Rural Water Use Efficiency (RWUE), "Irrigation for Profit" Team is a prime example of DPI's excellence in delivering priorities of Government from within the Agency for Food and Fibre Sciences. The team has achieved savings to the state of Queensland in the dairy and lucerne industries to the amount of **$6,950,000.00** in the previous two years. By June 2003, the Irrigation for Profit team will have exceeded its target of saving **33,000** Mega Litres (ML) of water throughout Queensland.

This **Rural Water Use Efficiency (RWUE), "Irrigation for Profit"** *project involves cooperation and collaboration from the commercial irrigation industry and interagency links, with Treasury via the Irrigation "Financial Incentive Scheme" (FIS) (valued at $1,000,000.00), and Department of Natural Recourses and Mines. The state's dairy and lucerne industry (farmers) have invested $3,000,000.00 as a direct response to the project, during the first two years (in direct management changes on farm). This has significantly improved Queensland's direction into positive irrigation management and practice change.*

*This team is proactive and has excelled in the delivery of technology and innovation with positive progress. They have forged major changes in the dairy industry during the last two years that are estimated to have achieved a **9%** saving in water use and an increase in best management practice of over **30%** to Queensland. This has been achieved by increasing production from irrigated pasture and lucerne by **6.5%** and reducing water use by **2.5%** (These figures are independent of any anticipated drought reduction or water restrictions).*

*Malcolm Martin (Project Leader) and his team of irrigation specialists; Mervyn Jessen, Che Murray, Scott Wallace, Ross Warren, Brad Silver, Greg Stanley, Caroline Biggs and Warwick Waters are nominated in the category of: **support for sustainable food and fibre industry development.***

In summary, Malcolm Martin's team has:

- Adopted an innovative process of adult and action learning to train industry (farmers and commercial retailers) and DPI staff in efficiencies with irrigation practice, scheduling, pump efficiencies, fertigation, and soil and water science all within a whole farm systems approach.

- The team has directly benefited Queensland in the irrigation industry by a reduction in water usage and increased production

- This team is an exemplary example of how DPI's staff excel in delivering Government priorities.

The following quotes from two participating farmers speak for themselves:

"This is the best project since sliced bread. The team energise each other and are a credit to the Department's Agency for Food and Fibre Sciences." The team has helped me achieve a gain of over 30% in water efficiency. ***Russell Fry*** *(Dairy Farmer) President of North Johnston and Lake Eacham Landcare group.*

"The government has come up with a project that all irrigators support and is doing great things for Queensland. This team of professionals has made great progress and are a credit to DPI's Agency for Food and Fibre Sciences."
Wes Judd, Chairman *(Dairy farmer) Queensland Dairyfarmers Organisation*.

Client focused

Services aligned to client needs

Priorities to achieve water savings and increased production are of immense significance to Queensland and its resource structure. Working with the industry at ground level has made possible major gains in water savings and production increases that benefit all Queenslanders. These have been achieved with the aid of 35 dairy and lucerne industry irrigation demonstration sites, statewide.

The "Irrigation for Profit" RWUE project is a three-year commitment. The project team amended its initial client focus after close examination of existing practices revealed that prior to developing new scheduling technologies with industry, the dairy and lucerne irrigation industry needed to develop better skills in irrigation plant management. These changes in consultation with industry have proven highly successful.

*In the year ending June 2002, the project has had **68%** participation of all dairy and lucerne irrigators in extension activities including; field days, workshops and farm visits. **24%** of these have had their irrigation systems checked and modified for Distribution Uniformity (DU%), pumping costs ($/ML) and application rate, and **38%** have used the Financial Incentive Scheme (FIS) to make improvements to their irrigation efficiency. The project has sent every farmer five publications containing in depth case studies of farmers improving their water use efficiency.*

Client recognition of positive outcomes of service/products

*"The staff have demonstrated to me that a simple change with no cost has given me a **10%** efficiency gain to my irrigation system".* **Adam Cleeve** (Lucerne Farmer, Texas)

*"Irrigation scheduling on farm has increased my production by **14.2%** and reduced water by 1.3ML/ha ".* **Trevor Stringer** (Lucerne Farmer, Biloela)

The highest accolade has been given to the RWUE team with major industry stakeholders meeting to support and develop a new strategy with Government agencies to have ongoing work in the RWUE area progress beyond June 2003. The Sustainable Agricultural Systems Initiative **(SASI)** group has been formed to develop a programmed focus of irrigation management and ongoing funding. This group will go to the Premier and Deputy Premier in October 2002 with a request for future continued funding.

*Dairy and lucerne irrigators are supporting this work by encouraging their membership to support the (SASI) group. Queensland Farmers Federation **(QFF)** is strongly backing this*

new project development. Queensland Dairyfarmers Organisation has also requested regular (monthly) news articles in their statewide newsletters to support the project.

New South Wales (NSWAg) agriculture (Water Wise) has approached Malcolm Martin (Team leader) to be keynote speaker at two major field days held in the past four months. Victorian Agriculture has also requested Malcolm to address dairy irrigators at a major irrigation field day early 2003, the topic of the address to be: 'Increasing management performance of irrigation.'

Early in 2002 Warwick Waters was asked to talk to the Queensland Rural Ministerial Advisory Council on 3 occasions addressing the team's achievements and the project benefits to the state.

Benefits of service or product promoted effectively

The team has been developing an Agronomic water use index. Through demonstration sites and research trials the industry has established benchmarks for agronomic water use efficiency. The following table shows the data collected from demonstration sites over a winter growing season compared to the Barraclough stock take figures (State Benchmark).

Table 1. Current trends against the 1997 Barraclough benchmarks.

	Production per Ha	**Irrigation**	**Rainfall**	**Litres/ML**	**$/ML**
2002	**7810 litres**	**2.96ML**	**1.5ML**	**1751l/ML**	**$542/ML**
1997	**6515 litres**	**3.75ML**	**1.5ML**	**1240l/ML**	**$384/ML**

This shows a 30% increase in the economic water use index.

Work in the lucerne industry utilises a Rule of thumb indication of 2.1 ton/ML over a three-year production system. Work with demonstration farms and groups associated with these farms over the past eighteen months have indicated that the range over these farms was 1.3 - 2.7 ton/ML in the 5 years previous to the project. Over the past twelve months information gathered from these members indicate that changes have taken place in information directly translating to ***increases in the range from 1.9 – 3.0 ton/ML.***

	1996 to 2001 Range (ton/ML)	**1996 to 2001 Average (ton/ML)**	**2001 to 2002 Range (ton/ML)**	**2001 to 2002 Average (ton/ML)**	**Increase (ton/ML)**	**$/ML Extra return**
Lucerne Demonstration Farms (12)	1.95 to 2.6	2.31	2.2 to 3.0	2.61	0.31	$62
Involved group members state wide (132)	1.3 to 2.7	1.91	1.9 – 2.85	2.37	0.46	$92

This project has actively promoted our departmental achievements by utilising rural and national media on at least a monthly basis and working effectively with other agencies EG: Natural Resources and Mines, Environmental Protection, Treasury and Ministers office.

Result/Outcome focused

Significantly enhanced outcomes for industry/business/communities or DPI service delivery

Below are listed some of the project outcomes thus far:

- "Irrigation for Profit" Team has achieved savings to the state of Queensland to the amount of **$6,950,000.00** in the previous two years.

- By June 2003, the Irrigation for Profit team will have exceeded their target of saving **33,000** Mega Litres (ML) for Queensland (Current savings **27,000 ML**).

    - *Results from (Lucerne) demonstration farms show an increased production of **5.3%** while using **3.4% less water**. This equates to an **8.7%** improvement in water use efficiency across the lucerne industry in 2002.*

    - *A survey of 500 farmers who have made changes through involvement with the project has shown an average of an **8.8%** improvement in water use efficiency across the dairy and lucerne industry in 2002.*

*Our on farm demonstration sites have measured up to **30%** reduction in water used to grow the same amount of feed. This has mainly been achieved by:*

- **Improving the Distribution Uniformity (DU%) of the irrigation system and accurately measuring application amount.**

- **Using scheduling tools to manage frequency and volume of irrigation events.**

- **Simple adjustment can improve efficiency: In one case four sprinklers were strategically remover from a centre pivot, gaining a** 10% **system improvement.**

We have strongly recommended that the dairy and lucerne industry focus on correcting irrigation system problems before trying to schedule irrigation. As a result about 230 irrigation systems have been checked across Queensland. The initial test sought to determine DU%, application rate and pumping cost ($/ML). We have since included a pump efficiency test.

Evidence of demonstrable results/benefits

The Rural Water Use Efficiency (RWUE), "Irrigation for Profit" Team has achieved savings to the state of Queensland the amount of **$6,950,000.00** in the previous two years. By June 2003 Irrigation for Profit team will have exceeded their target of saving **33,000** Mega Litres (ML) for Queensland (currently **27,000ML**).

In the year ending June 2002 the project has had **68%** participation of all Queensland dairy and lucerne irrigators in extension activities.

*This team has excelled in the delivery of technology and innovation with positive progress bolstering DPI's 'Agency for Food and Fibre Sciences'. They have forged major changes in industry during the last two years that are estimated to have achieved a **9%** saving in water use and an increase in best management practice of over **30%** to Queensland. This has been achieved by increasing production from irrigated pasture and lucerne by **6.5%** and reducing water use by **2.5%** (these figures are independent of any anticipated drought reduction or water restrictions).*

Innovative

Service or product accepted by co-workers/peers as innovative

This can be demonstrated by team members of the project being requested to deliver workshops across industry/agency and aiding cross industry workshops in Cotton and Grains, Fruit and Vegetable and Sugar irrigators.

Project staff running and being guest speakers at workshops and field days with interstate water projects. The Minister has requested team members address directly the Queensland Rural Ministerial Advisory Council on 3 occasions putting forward the team's achievements and the project benefits to the state.

Research Corporations (Eg: Dairy Research and Development Corporation) have requested technology input into project development from this experienced team.

The Irrigation for profit team instigated an awards program to the dairy and lucerne industry, for acknowledgement of Best Management Practices to farmers in irrigation management. Other industry groups in the Rural Water Efficiency program have now followed these awards and structured evaluation process.

Team members were requested to give scientific papers at the recent "Irrigation Association of Australia" conference in Sydney.

Innovative approaches to products/service delivery results in demonstrable improvement for industry/business/communities/internal clients

High-end technology innovation with industry.
The "Irrigation for Profit" team have pushed the envelope of technology and farmer training in the use of new technologies. They have developed an integrated communications link, incorporating radio, analogue and digital data storage, transmission and retrieval systems.

These linked and automated monitoring sites measure water infiltration through the soil to depths of 2m and then transpose the data in a presentation that farmers and the team can check that crops are gaining the required amount of water for maximum development (yield) whilst checking for over watering that would be detrimental to yield and plant development.

This monitoring sites service industry with weather data, soil moisture and plant requirement information data from a desk in Toowoomba with probes and weather stations in Atherton, Rockhampton, Biloela, Monto, Gympie, Mutdapilly, St.George, Pilton, Inglewood and Texas. The team has provided training to farmers in these technologies. Farmers now download and interpret their own farm data.

Staff and farmers from home or a mobile telephone can also download data from their sites on the run. Probes can be radio and mobile linked from many kilometres away. Small modems recharged by solar power operate these environmentally friendly systems. This results in savings of time, kilometres travelled and water.

Southern state departments have come to us to provide technology information on requirements and system set-ups for delivery of information to their clients.

Reduced environmental impact is a major positive for industry involvement in the RWUEI and has been a win-win relationship with environmental sustainability issues. Generally if management changes are made to improve water use efficiency, they will also decrease environmental impacts. Key Best Management Practice guidelines that have a direct sustainability advantage include reducing nutrient and soil movement away from the root zone, limiting water use and pumping to only what is required by the plant and managing pasture and crops to keep ground cover and reduce weeds.

The team is about to launch and email irrigation update service in collaboration with the Queensland Dairyfarmers Organisation for the dairy and lucerne industries. This service is based on permission marketing principle, which utilises the potential in the Internet to provide specific and relevant information to large and diverse groups of people. It allows subscribers to select specific categories that interest them which are then sent as short updates or fact sheets as they come to hand.

National actions suggested by a Dairy Research Development Corporation (DRDC) and the National Land and Water Resource Audit indicated strong support for regional initiatives to improve water use efficiency, with an emphasis on infrastructure improvement, alternative irrigation systems, water reuse and irrigation scheduling. The report recognises that in Queensland there is a strong proactive focus on irrigation with the Queensland Water Use Efficiency project (p90). DRDC is currently considering funding a national project to promote further adoption of BMP to follow the achievements of this project.

Cross business unit/agency cooperation

Collaborative arrangements across business units or agencies in service delivery

The strength of industry networks continues to grow. The dairy and lucerne RWUE program has been a great success in pioneering strong partnerships with other RWUE programs (esp. Cotton and Grains, Fruit and Veg) industry and government. In the past twelve months no fewer than 6 joint field days have been held that have involved a joint commitment with irrigators from Cotton and Grains, Fruit and Veg and relevant extension staff.

Strong linkages are maintained with **NR&M**, **EPA**, **Treasury**, Cotton and Grains industry **(Cotton CRC)**, Queensland Fruit and Vegetable growers **(QFVG),** Sugar **(BSES),** by quarterly meetings where all are kept in the communication loop. These are interactive meetings where all present their recent activities in written and multi media formats.

*The irrigation for profit team have worked along side, cotton and grain, fruit and vegetable staff working on system checking processes and tool kits (information for BMP), involvement in the **sugar and cotton industry** awards programs (Judging), attendance at*

*field days and developing common objectives (such as the meetings with the **Kondinin group**). Joint cross industry field days held at Allora, Dalby and shortly at Laidley.*

*Other involvement with **NSWAg** water wise in field days and guest speaker presentations at state and national level have also occurred.*

*There are also strong linkages with the Cotton and Grains irrigation program with Farming Systems Institute **(FSI) DPI** e.g. through field days and training. Worki has also been undertaken with the Environmental Protection agency and Natural Recourses and Mines with planning and industry issues.*

Contribution to whole of government priorities

The irrigation for Profit team has shown its enhancement of government priorities by:

- Development and management of technologies that aid in the reduction of water use and facilitates production increases by encouraging and developing better practices in water management

- New water scheduling technologies along with up grading irrigation plants with low-pressure systems to develop practices that utilise environmentally and ethically sustainable management systems in irrigation practice.

- Utilise media to communicate our demonstrated best practice results for research undertaken, maintaining a clean, green sustainable focus. Marketing our successes both statewide and nationally.

- Promote and encourage joint and positive relationships with rural and urban Landcare and Catchment groups, demonstrating cross linkages with community groups both urban and rural.

- Encourage regional rural communities to take up the challenge of enhancing water management practices and maintaining and developing production in rural industries.

Attachments

- Letter of support from Queensland Dairyfarmers Organisation Adrian Peake CEO.
- Letter of support from Ken Smith A/Manager RWUE DNR&M.
- Photos and captions and video on a CD, Dairy and Lucerne RWUE in action.
- Video interviews with stake holders in support of the Irrigation for Profit team on CD
- An updated presentation can be made available on CD should the team progress to further stages of judging

Judging Panel
DPI Client Services Awards
c/o Michelle Rodgers
DPI Client Services Awards Secretariat
Workforce Planning and Development
Level 7,
Primary Industries Building
80 Ann Street
Brisbane QLD 4000

October 2, 2002

Dear Judges,

The Queensland Dairyfarmers' Organisation Ltd (QDO) takes great pleasure in writing to you to support the nomination of the DPI Rural Water Use Efficiency (RWUE) Team (Dairy/Lucerne) for a DPI client service award.

The RWUE program is an absolute success delivering real results to producers, the community, government and the environment, a triple bottom-line result. While the partnership methodology of this program is extremely effective and an example to all, the programs ultimate success lies with a team of dedicated people that have been responsible for the programs delivery.

We have found the DPI RWUE Dairy/Lucerne Team to be a group of highly skilled and organised professional agriculturalists that have applied themselves with unrelenting enthusiasm, which has provided the catalyst to helping producers harness new technology and techniques.

This group has encouraged, sponsored, developed and skilled industry to enhance producers expertise in water management practices, which have resulted in setting new benchmarks of performance for industry. These results have been achieved through a combination of practicality and utilisation of adult education practices, current science in irrigation technology and agronomic practices. This team is helping to advance industry towards new levels of performance with a water use efficiency savings target of 11% in the state of Queensland, while also increasing on farm productivity and environmental outcomes.

The RWUE dairy/lucerne team is delivering to industry in-depth training in water management skills and practices that are delivering results on the ground. These specific areas of training have never been readily available to industry at such a high level.

This team has also actively fostered strong working partnerships with our organisation, industry and linkages between academic institutions and practical on farm knowledge bases. The team has given training to both farmers and commercial industry in the areas of irrigation practice management, which has already produced direct and ongoing agricultural water use savings and stronger productivity growth for the sector.

The QDO is honoured to present our strong support for the nomination of the RWUE team led by Malcolm Martin for a DPI client service award.

Yours sincerely

Adrian Peake
Chief Executive Officer