



IRRIGATION RESEARCH & EXTENSION COMMITTEE

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FOR IRRIGATION CROPPERS

**The future of irrigation
– where are we going**

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If nothing else the CRC for Irrigation Futures has clearly established that a wide range of Australia's leading irrigation and environmental researchers are confident that

Irrigation does have a future

This future though can only be secured through effective partnerships between industry, community and government – partnerships which have sometimes and in some regions been missing in our industry.

The CRC IF was established in large part to provide an effective home for these partnerships at a national scale. The breadth of stakeholders and skills represented on our board are a testament to this shared confidence and sense of partnership.

John Williams and Peter Cullen, often quoted by the media and industry representatives as arch enemies of the production of agriculture and irrigation, in particular sitting down next to progressive irrigation farmers such as Mike Logan and Stefano Mills and water service provider executives such as Denis Fleet, with Peter Hayes (an employee of one of Australia's largest corporate irrigators sitting as chairperson), you would think it would lead to some good fights – but to date not at all – but there is a strong sense of urgency.

Now is the time for the industry to really begin to deliver on its historical promise and current commitments – now is the time to be committing to the future of our industry by signing onto the CRC challenge to:

- Double irrigation productivity
- Improve profitability; and
- Enhance our irrigated landscapes.

This commitment to the future of irrigation by our board is currently backed up by our partners, all of whom are putting in cash and in kind toward our shared objectives. Not all the organisations we believe should be contributing are, but the combined partnership of the CRC IF and its funding partner NPSI demonstrate a broad ranging mandate for a real and progressive future for our industry.

It is critical that this confidence is justified in the decisions taken by each of us as individual irrigators and by our representative organisations.

Within the CRC IF we believe the future of irrigation and the confidence of our nation in our industry can best be achieved through delivering the following strategic intents:

- Maximise irrigation productivity at the enterprise level
- Measure our impact at a catchment scale
- Deliver catchment wide productive and environmental synergies; and
- Use this performance to communicate and positively influence the irrigation policy debate.

During this discussion I wish to deal with each of these issues separately.

Maximising Irrigation Practice at the Enterprise Level

In order to achieve progress in this area we must at least have the following elements in place:

- Effective business and personal drivers for improvement
- Measurable indicators of performance
- The knowledge and skills to change; and
- Financial resources to move forward.

What are the drivers for improvement today – Irrigation as you all know is first and foremost a business – the application of water to crops in order to maximise our economic return – but like most small businesses

there is more to it than fixed ROI hurdle rates.

Most irrigation businesses are driven by a combination of three key factors:

- Profit
- Lifestyle; and
- Sustainable resource access.

Policy makers believe that in implementing water trading policies they have understood the profit motive and have generated a simple mechanism for ensuring water moves to its highest value use – which in their minds means turning Australia into the largest vineyard in the world – ?? Those of you who operate a mixed cropping or farming business realise there is more to water investment decisions than a simple calculation of gross or net return per ML – issues such as lifestyle, risk – market and production, and land use impact all affect land and water managers' final choices.

The one thing which should be consistent across all water users though is a desire to maximise return/ml within an existing enterprise – that is get better at what you are good at first – rather than seeking to change industries.

The real competition for water in future will not be between irrigators and the environment, or broadacre irrigators and horticulture, or horticulture and urban users but will be within industries – those who can consistently achieve higher than average productivity will continually be in a position to capture more water in the market place.

It is critical therefore that if you intend staying in the game, you have the capacity to test your performance against others and to continually improve.

How many of you today can accurately tell me their water productivity on a block by block basis – ie how many of you can accurately measure water at the paddock scale?

Without this knowledge you have little chance of optimising your performance or staying ahead of the competition. The minimum data set we should attempt to capture at an

on-farm level should at least include:

- A complete and accurate water balance for our farm at the field scale based as far as possible on measured inflows, outflows, and regionalised crop ET
- Accurate paddock scale measurements of water productivity and efficiency – preferably including some form of precision irrigation based crop mapping; and
- Measured soil solute movement – tracked over time including salt and nutrients.

Given this information where will our industries be heading? Horticulture has effectively been through the application system revolution over the past 15 years. Broadacre irrigation practice in Australia is yet to have its revolution – but it is coming.

It is clear that overhead irrigation systems currently provide a cost effective opportunity for productivity improvement in nearly all environments and in nearly all broadacre irrigated commodities – rice being perhaps the one exception.

So clearly we will see a massive shift toward these technologies over the next decade. In terms of numbers, what does this mean?

Region	Major irrigated sector	Area targeted for conversion (hectares)
Coastal Queensland (Qld)	Sugar, peanuts	10,000
Northern Murray-Darling Basin (Qld/NSW)	Cotton, grains	66,000
Murray & Murrumbidgee (NSW)	Grains & pastures	10,000
Goulburn-Murray (Vic)	Pasture	30,000
South-East Catchment (SA)	Pasture, lucerne seed	10,000
Harvey Irrigation District (WA)	Pasture, grains	6,000
Total		122,000

With savings of around 2ml per ha being regularly achieved on conversion this investment can deliver an effective 240GL of additional productive water to the irrigation industry – along with additional productivity gains generated through increasing agronomic performance and cropping flexibility.

At an average conversion cost of around \$2,500 this represents an approximate \$300 million investment or \$1,200 per ML.

Over time we will see the performance of these machines being significantly improved through the development of automatically controlled adaptive plant based sensing systems which monitor crop response and apply water accordingly.

Can it happen – simply take a trip to Saudi or the Sudan or Iowa or Texas and you can practically see the reality of this scale of mechanisation. Based on an average 55ha centre pivot this represents around 2,200 machines over 10 years – chicken feed really given the scale of our industry.

This is but one of the latent productivity improvement opportunities awaiting our industry based on current (50 year old) technology. Imagine the possibilities that await those who have or are going to take on tomorrow's technologies.

It is at this stage I must declare a clear conflict of interest, as this is the area in which the CRC IF is actively pursuing research opportunities – the whole concept of plant based adaptive irrigation management systems – moving away from soil water as the proxy for plant water sensitivity – that is one of our key areas of research.

Will it happen? Well that depends on your confidence in the future of the industry.

Measurement of our impact at a Landscape Scale

Measuring your enterprise productivity is a personal thing – measurements are primarily based around on-farm activities' inputs and outputs.

Landscape scale impacts need to be measured on a collective basis as you are not judged upon your individual performance but rather that of the impact of the collective – this makes this area not only technically challenging but also socially challenging. In this region and further south you have developed some very sound collective landscape scale monitoring programs – for ground water impacts at least. This capacity will need to be expanded to include a much broader range of indicators including irrigation impacts on surface water systems and regional biodiversity.

Some may argue that this is not our responsibility but should be “the government's” or the public's – or at least someone else's!

This comes back to who is responsible for the third driver of change in any business model:

- Profit
- Lifestyle; and
- Sustainable Resource access.

Continued access to the water we all use will depend not only on your individual capacity to improve productivity with respect to your neighbour but also your capacity to demonstrate that you have done so in an environmentally sustainable fashion.

On my farm I attempt to carry insurance against those occurrences which would be fatal to my business performance

- Crop failure due to hail
- Theft of major equipment items
- Fire and storm damage to my silos and sheds; and
- Electrical damage to my irrigation pumps.

This insurance cover protects less than 25% of my fixed assets though – in my case water represents about 40% of my total asset base and I have no insurance cover at all regarding the short or long term access to that resource.

Interestingly enough there is now at least one short term water access insurance product available, delivered through the Sydney Futures Exchange providing some form of hedge against backward movements in the storage levels in a number of NSW major storages.

I am sure that over time our WSPs and other financial institutions will develop a whole range of innovative physical and market based water insurance products.

But in the long term your ability to objectively demonstrate your environmental sustainability will represent one of the most critical Water Insurance Products of all.

Doesn't it make sense then for us as an industry on a regional basis to put in place our own measurement and recording systems or at least cooperate actively in the design and implementation of these systems with partner organisations such as government or CMAs.

Clearly many regions are doing this – but some are better than others. I recently looked at some Catchment Reporting information from the Angus Bremmer – where Tony Thompson has been working for a number of years – and was extremely impressed by the diversity and intensity of the monitoring occurring in this region.

In addition to the farm based recording undertaken for productivity assessment we should track

- Regional ground water movement – quantity and quality
- Regional surface water – quantity and quality
- Key fresh water ecological indicators
- Regional biodiversity indicators.

As farmers we have got pretty good at monitoring performance of complex biological systems – identifying the critical components of a system which needs to be measured and identifying where possible, automated systems for doing so. In many cases we outsource this task to professionals on a fee for service basis – such as crop consultants and the use of automated systems such as soil water monitoring equipment – Why not apply this same discipline to the other side of our business?

What components of environment can be automatically monitored

- Ground water levels and quantity – there are now cheap sensors and loggers –which should be down every hole providing continuous logging of critical elements of the system
- Surface water quality systems are also available
- Ecological indicators – how about real time monitoring of fish populations using in situ fish monitors – or electrical conductivity meters
- GIS, telemetry and web based interfaces make all these systems doable in a cost effective and efficient manner.

I cannot help but think that if as an irrigation industry we applied the same business principles to our environmental monitoring activities as we do our farming practice we could achieve much improved efficiencies in this area. This will see the establishment of a set of “New Age” farm consultants who not only advise on bug numbers, crop nutrient status and soil water – but will increasingly be involved in preparing “Integrated Area Wide Catchment Health Reports”.

Delivering Catchment Wide Synergies between Productive, Environmental and Social Outcomes

Profit, lifestyle and resource security may drive our business but clearly other factors drive the community as a whole. Our capacity to broadly monitor our performance is a defensive response to a perceived risk.

In order to secure our long term position as managers of up to 70% of the fresh water in our major river system, we will need to demonstrate a capacity to not only deliver productive outcomes but to be involved in delivering a more holistic set of products and services in line with consumer and community perceptions and demands.

Any first year student of marketing will remember the paper presented by Kotler of the Harvard Business School entitled “Marketing Myopia” in which he points out the first step to marketing success being an understanding of what business you are in.

As irrigators I think most of us are realising that we are not simply members of the rice or cotton or dairy industry – but members of the irrigation industry broadly and are now prepared to consider growing whatever cropping mix maximises my return on available water and other resources.

We will need I believe to take a further step back and say we are not simply professional irrigators but will need to become professional water managers, capable of delivering the traditional physical products associated with food and fibre, as well as a broad range of ecosystem and socio-cultural services to an even broader range of regional, national and international markets.

In 20 years time I am pretty confident that my P&L will have:

Product Income

- Grain
- Hay
- Etc and

Services income

- Ecosystem Service returns
 - Riparian Zone Management
 - Billabong maintenance
 - On Route environmental water storage
 - Etc

- Socio-cultural services
 - Fisheries management
 - Picnic area maintenance
 - Cultural site protection

By beginning to think in these terms I believe our industry has a much greater capacity to extract 'win win' outcomes from the currently grid locked debate between the environmental and productive values of water in our community.

Entering these markets and undertaking successful deals will be just as difficult as the first time you successfully negotiated a contract with Allied Mills or Cargill – but there are real opportunities there.

Again I must acknowledge a conflict of interest here in that the CRC IF is just in the process of rolling out within its second stage research plan an ambitious process called "System Harmonisation" of Catchment Scale hydrologic modelling linked to an innovative Regional Business Partnership based implementation plan to attempt to capture both the productive benefits of improved water cycle management – and the delivery of new service based products to the community and the environment.

Watch this space and we hope to be able to involve communities across Australia in this process.

Communicate and Influence

Agriculture generally and irrigation in particular currently feel significantly under valued by the community with many examples of industry based promotional campaigns currently being mooted or launched.

I don't dispute the value of these but believe that soundly and objectively recorded performance speaks louder than a lone lobbyist or PR campaigner.

The CRC has established a project to support TBL reporting of irrigation dependent businesses and regions. Many of our major WSP are attempting this in their own right but we believe there is a real opportunity to establish a national if not international reporting framework to allow more effective presentation of our performance to those that matter. Delivering a transparent and independently assessed process for demonstrating our economic, environmental and socio/cultural record to our communities, our governments and importantly our investors.

We need continual capital investment into our industry – and Macquarie Bank is not knocking on our door to get a piece of what is arguably one of the most profitable components of our economy. Why – because there are too many unanswered questions regarding our TBL performance. We need to get these out front – to expose the poor performers and seek ways of reducing their impact on the image and performance of our entire industry – and build a sound future based on Performance rather than Historical Right.

So in summary

What is the future of our industry?

It is one which

- Is continually maximising enterprise level productivity
- Is openly and actively monitoring its impact at a landscape scale
- Is actively seeking catchment synergies by entering the ecosystem and socio-cultural services market; and
- Has influence through demonstrated TBL performance reporting.

The CRC IF is actively involved in projects aimed at supporting the ongoing development of this industry at all these levels – and we welcome your involvement in this journey.