WaterWheel

NATIONAL PROGRAM FOR IRRIGATION RESEARCH AND DEVELOPMENT
ISSUE 2. OCTOBER 1995 ISSN 1324-4604

GUEST COMMENTARY

By their very nature, primary producers are independent, and may therefore resent regimentation or be reluctant to take part in a team effort.

Irrigators use this very philosophy as they independently complain about the treatment measured out to them by Governments, and yet they appear to have great difficulty getting their act together and forming an alliance that will challenge the status quo.

Irrigation is important not only to the livelihood of irrigators, but also is of paramount importance to the nation as a whole.

We have two major forces to contend with. First, the modern trend to the 'user pays' principle. Real justice is that the beneficiaries should pay. The user makes a living from a commodity produced with irrigation, but the benefits do not cease at the farm gate – they spread throughout the community and the nation. The costs associated with irrigation and the supplying of water should therefore be shared among the beneficiaries.

The second issue is the now Holy Grail of the environment. I am the first to admit that the environment must be addressed and taken fully into consideration when there are irrigation projects being considered and evaluated. However, there must be a balanced view, with due consideration for ***all*** *aspects of plans for irrigation and other developmental projects. A minority section of the community can delay and even prevent irrigation projects coming into being, while our statesmen keep their eye on the ballot box and disregard the fact that Australia is the driest continent on this earth. They cannot and should not disregard the need for water and irrigation for our future prosperity.*

We have, as a nation, a number of situations (e.g. salinity) that need attention, but let us not throw out the baby with the bath water.

Our problem with salinity and over use of some resources needs to be addressed on a community basis such as Landcare, rather than piecemeal efforts which will attempt to further victimise the user. We need all beneficiaries to get in and tackle the problems and remedy the situation. The only way that irrigators will get justice in the present debate is to form strong, unified state associations which will debate the major issues (which differ from state to state) and have their disadvantages redressed.

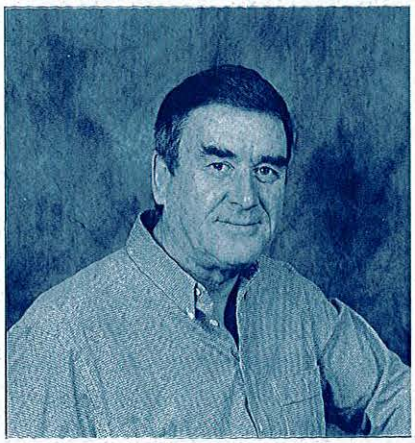
Further, they need to have a national focus on issues such as the environment which have a national agenda, and are extremely important for an overall policy at Federal Government level.

Also, there is a need for alliances with others in the irrigation industry to pursue common interests. A combined industry approach can have a much more politically acceptable impact, and therefore achieve greater benefits.

In conclusion, irrigators need to focus on the issues at hand and forego some of their treasured independence for the collective benefit of all irrigators.

Harry Bonanno,
CHAIRMAN, CANEGROWERS

IRRIGATION COORDINATOR APPOINTED



Dave Wesney

Mr David Wesney has been appointed as the Coordinator, National Program for Irrigation Research and Development (NPIRD).
David is an agricultural economist with wide experience in applied agricultural economic research in Australia and overseas.

Over about 10 years, David worked on, and then managed a program in the (then) Bureau of Agricultural Economics (BAE), evaluating the economics of irrigation projects submitted by the States to the Commonwealth for funding under the National Water Resources Development Program. He also assessed agricultural development projects (mainly irrigation) proposed for funding by the World Bank, when he was employed for three years as Mission Leader in the World Bank/FAO Cooperative Program in Rome.

In the BAE, David had a range of responsibilities, including management of the crop commodities forecasting Branch, the establishment and management of the Field Officers' group responsible for data collection under the BAE's industry surveys program, the establishment of a forestry economics program, and the management of a program of economic evaluations of a range of rural development projects in Australia.

From 1983 to 1993, David was an Assistant Director in the Australian Fisheries Service. There, he was responsible for managing Commonwealth fisheries on an ecologically sustainable basis. This involved all aspects of program management from policy formulation and advising to the Government, to practical day-to-day operations, including management of substantial industry adjustment plans in specific fisheries.

Since July 1993, David has been Director of his private Consulting Company, 'Resource Use Evaluators,' located in Canberra.

David may be contacted directly at his office at 49 Warragamba Avenue, Duffy, Canberra, ACT, 2611; telephone/fax: (06)288 1215, or via the LWRRDC office.

FOR YOUR FILES.....
In this edition of WaterWheel you will see the first two of a series of information sheets which you will be able to remove and file for further reference.

Series One: **Workshop Reports**
Series Two: **Research Reports**

JOIN THE IRRIGATION SUPER HIGHWAY!

The *Streamline* database, jointly sponsored by LWRRDC and the Urban Water Association of Australia, is an information source containing details of not only LWRRDC projects, but the broader published literature. Irrigation is targeted under this scope of the database. Access to the database is available directly on-line via the Ozline network, CD-ROM and hardcopy.
For further information: contact Pam Handyside, *Streamline* Manager, GPO Box 155, Canberra, ACT 2601. **Telephone:(06) 236 6267; facsimile (06) 236 6440, or E-mail infoscan@acslink.net.au.**

NPIRD Management Committee meeting: Wagga Wagga, 18 August 1995

Appointment of program coordinator

The Committee approved the appointment of Mr David Wesney as the Program Coordinator. Mr Wesney's appointment and contract will be reviewed annually. A budgeted action plan for the Coordinator will be prepared for approval by the Committee at its next meeting.

Future program funding arrangements

Letters have been sent to past funding partner organisations seeking their continued financial support for the program when its new phase begins in 1996-97.

Gearing up for the start of the new phase in July 1996 will involve a review of the existing program, the development of new program priorities with the assistance of stakeholders in the irrigation industry, negotiations with funding partners, and an assessment of R&D capacity. The organisation of these activities will be largely the responsibility of the Program Coordinator.

Infrastructure refurbishment and water supply systems

Mr Michael Bryant, Principal Investigator, outlined to the Committee the key features of his proposed project '**Viability of irrigation infrastructure refurbishment and implications for private ownership**'. The Committee approved LWRRDC funding of $150,000 for the two-year project. The Centre for Water Policy Research, University of New England will carry out the project in collaboration with the Land and Water Economics Section, ABARE, and the Division of Water Resources, CSIRO, Griffith, NSW. *See page 4 for more details.*

Long term salinity strategies

The Committee agreed that further discussions be held between LWRRDC and the Murray-Darling Basin Commission in order to progress arrangements for combining a new MDBC project on **'Future profiles of irrigation catchment'** with proposed salinity studies.

Project reviews and evaluations

The Coordinator will prepare a program for the review of the progress of several projects during the latter half of 1995. In addition, the Coordinator will carry out benefit/cost analyses of a small number of selected projects as part of the overall review process to assist with the development of the new five year program beginning July 1996.

Closer links between NPIRD and NLP

The Program Manager and Coordinator are to explore the possibilities for closer linkages and cooperative arrangements between the NPIRD and the National Landcare Program.

APOLOGY TO IRRIGATORS

It was brought to our attention that we had not included 'Irrigators' as an identifiable group of program partners on page 1 of the July 1995 issue of the newsletter. This was an oversight on our part and we apologise to all irrigators for the omission. One of the most important aspects of the NPIRD that helps to ensure widespread delivery of the program benefits is the close communication with, and involvement of irrigators in individual projects.

NEW IRRIGATION INFRASTRUCTURE RESEARCH PROJECT

The NPIRD Management Committee recently approved funding of $150,000 over two years for a research project entitled ***'The viability of irrigation infrastructure refurbishment and implications for private ownership'.***

The project will be undertaken by the Centre for Water Policy Research at the University of New England (UNE) in collaboration with the Australian Bureau of Agricultural and Resource Economics (ABARE) and the CSIRO's Division of Water Resources.

Mr Mike Bryant, Senior Project Director at the Centre for Water Policy Research, University of New England, is the Principal Investigator for the new project. An advisory committee comprising irrigation industry representatives and technical specialists will be set up to help guide the progress of the project.

The main aim of the project is to develop a mathematical modelling framework to assist in the identification and development of viable irrigation refurbishment options.

'The methodology is used by many businesses including banks, manufacturing and transport companies to help solve complex investment and operational decisions to minimise costs,' Mr Bryant said. 'It is also used for farm planning and animal feed ration formulations.'

The model will take into account the production potential of irrigation farms served by existing schemes, the component costs of alternative water delivery systems, and options for expansion or contraction of these schemes.

Part of the study will involve the development of an economic and physical profile of irrigation farms in the Murrumbidgee region of NSW. This part of the work was commenced in August 1995 by the Survey Section of ABARE. Economic and technical data will be used to develop and test the model on a case study scheme.

Mr Bryant believes that the irrigation water supply agencies will be the immediate beneficiaries of this work. They will continue to face major investment decisions about irrigation refurbishment, and the application of the proposed model has the potential to save millions of dollars throughout Australia.

With increasing pressures being placed on the irrigation industry for self management, self sufficiency and responsible environmental management, a modelling tool should help managers to better evaluate refurbishment options and the implications of private ownership of irrigation schemes.

Right: Polythene pipes being laid to replace part of an open channel system in the MIA of NSW (Photo courtesy of Department of Land and Water Conservation).

PROGRAM CONTACT:
David Wesney
Irrigation Coordinator
may be contacted at
• LWRRDC
GPO Box 2182
Canberra ACT 2601
Phone (06) 257 3379
Fax (06) 257 3420,
or at his home office
• 49 Warragamaba Ave
Duffy Canberra ACT 2611
Phone/fax (06) 288 1215

Land & Water Resources
Research & Development Corporation

Editing, design and artwork by Sally Berridge

WaterWheel

WORKSHOP REPORTS 1

FUTURE NATIONAL IRRIGATION REPRESENTATION

REPORT FROM THE AUSTRALIAN IRRIGATION COUNCIL (AIC) WORKSHOP, CHARLES STURT UNIVERSITY, WAGGA WAGGA, 18/19 JULY, 1995

'A VISION FOR IRRIGATION'
AIC, AUGUST 1994

- *Australian irrigated agriculture has a bright and ecologically sustainable future.*
- *A key to the revitalisation of irrigated agriculture will be the rapidly expanding demand in South East Asia..*
- *A key change at farm level will be that farmers have money to invest.*
- *Irrigators will fully participate in national research and development programs.*
- *The driving force of the new era of sustainable irrigation techniques will be farmers working closely with the irrigation equipment industry.*
- *Industries supporting the revitalised irrigation industry will improve their operations to facilitate and benefit from exports of irrigated agriculture.*
- *The international marketing of irrigated agricultural products will be enhanced at first by government assistance.*
- *Irrigators, communities along rivers, and the managers of water storages will understand and care for the needs of the environment.*
- *Attention will increasingly focus on urban irrigation. Water recycling will become increasingly important in the strategies designed to lower consumption rates.*
- *A revitalised and ecologically sustainable irrigation industry will promote its rejuvenation to the community until public perception is positive and supportive.*

The irrigation industry has, for about three years, been represented by the fledgling AIC, which is now winding down its operation. At the workshop it was generally agreed that the industry needs a national irrigation organisation, but there were several views on how it should be constructed. It seems that some water will have to go under various bridges before a new body appears.

If the AIC vision is to be implemented, the irrigation indusry will need a solid, active and sustainable successor to the AIC. This new Council will have to make *'irrigation'* less synonymous with *'degradation'*, and promote environmentally sensitive irrigation as a key to the revitalisation of agriculture and agricultural exports.

To be effective, the body would need to

- lobby for industry-wide policies to the Federal Government
- promote a vision for irrigation, and a strategy for the implementation of that vision
- prepare strategies for the industry and for research
- promote the value of irrigation
- represent the industry at the national level
- protect the irrigation industry from radical proposals.

The members of a successor body to the AIC should consist of representatives from: **Irrigators; the Irrigation Association of Australia; the Australian National Committee on Irrigation and Drainage; Rural Water Supply Agencies; academic, research and educational institutions.**

The new body needs sufficient funding for at least one full time officer to be based in Canberra. The AIC recently valued irrigated production at $6 billion per year. An industry worth this much should be able to fund adequate national representation.

Major national decisions will be made about irrigation in Australia over the next decade. If the irrigation industry is not strongly represented in the Federal arena, the irrigation industry agenda will be developed by conservationists and bureaucrats. The irrigation industry needs to focus on these national issues and become a major player in the decisions.

Tim Barker,
Executive Director, AIC

(These are Tim's personal views and do not necessarily reflect the views of the AIC).

REPAIR OPTIONS FOR CONCRETE-LINED CHANNELS

REPORT FROM THE NPIRD FUNDED WORKSHOP ORGANISED BY WATER RESOURCES, QUEENSLAND, IN MELBOURNE ON 4 MAY 1995

The idea of the workshop was to have a 'think tank', so participants were drawn from water agencies around Australia and from experts in the field of concrete lining rehabilitation and replacement.

First, the factors causing deterioration of concrete -lined channels were examined, and different aspects of deterioration were defined. Participants then described and discussed current solutions. From this, a range of potential research and development areas were identified and ranked in order of priority. The final session examined possible sources of R&D funding.

It was decided that all Water Authorities considering rehabilitation or replacement options for concrete-lined channels, should have an asset management system in place that would allow them to develop appropriate strategies for either the rationalisation, decommissioning or continued operation of the deteriorating channels.

An asset management system is an essential basis for decisions about the rehabilitation of channels which are site- and case-specific.

Land & Water Resources
Research & Development Corporation

RECOMMENDATIONS FOR A TWO-PART LWRRDC-FUNDED RESEARCH AND DEVELOPMENT PROJECT

1. Development of a decision support methodology that would assist an agency to determine repair or replacement options, and which would include a defect description system to define the condition of localised faults and the overall condition of specific sections of concrete lining.

2. Development of guidelines, specifications or current practice notes for a range of options including:

- joint repairs
- crack repairs
- concrete replacement and patching
- foundation stabilisation membranes (both flexible membrane liners and spray-on applications for above and beneath concrete linings)
- slip forming replacement lining
- prefabricated replacement lining
- post-joint installation in existing non-jointed concrete
- shotcrete over concrete and onto geo-textiles
- pipe replacement options
- revetment systems (grout filled).

3. Benchtop laboratory assessment of appropriate commercially available sealants is necessary and there was an indication that industry funds would be available.

4. Cooperation with various agencies in field trials with the products, materials, and techniques agreed to at the workshop.

Funding and 'in kind' support was offered by several sources at the workshop. A proposal addressing these issues is being prepared for submission to LWRRDC by QDPI Water Commercial Group.

For further information, contact:
John Cantor, Phone (07) 3224 7370

PROJECT CWN5 – RIVER POLLUTION WITH AGRICULTURAL CHEMICALS

This project, funded by LWRRDC and The Murray Darling Basin Commission, has recently concluded. The principal researchers were Dr Kath Bowmer and Dr Wolfgang Korth, from CSIRO Division of Water Resources, Griffith, NSW.

The areas chosen for the study were the Murrumbidgee and Coleambally Irrigation Areas (MIA; CIA) of NSW.

PROJECT AIMS

The general aim of the project was to investigate the fate, transport and biological impact of a number of pesticides commonly used in irrigated agriculture.

Although chemical techniques could be used to measure the presence and concentrations of individual pesticides, it was known that biological methods were needed to assess their potential aquatic ecosystem impact. The combination of both techniques gave the best chance of determining the extent of drainage water toxicity, as well as identifying the likely cause.

PROJECT OUTCOMES

- Chemical methods were developed to detect, identify and measure the chemicals of concern.
- Rapid methods for the field measurement of molinate, chlorpyrifos and organophosphorus pesticides were trialled in the field, and results demonstrated to relevant organisations. Rapid methods for other pesticides are being developed.
- Commonly used pesticides for rice, maize and horticulture were measured in drainage water and surface drainage over two irrigation seasons, with frequent monitoring, so that rapid changes in levels could be detected.

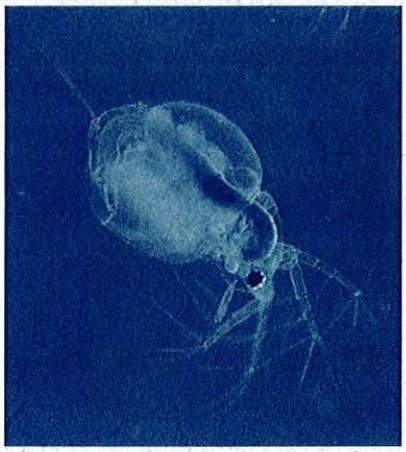
Concentrations of all chemicals measured were well in excess of water quality guidelines, in many cases exceeding drinking water recommendations and in all cases exceeding levels recommended for ecosystem protection.

- The Riverina Irrigated Agricultural Chemicals Taskforce was established, with the objective of reducing contamination of supply and drainage waters of the MIA, CIA and more recently the Murray Valley Irrigation Area.

The Taskforce is using information from the study to develop practical help for irrigators, using the ideas of 'Best management practice' and 'Water quality guidelines'.

- Best management practices are currently being developed to reduce the volume and contamination of drainage water. Possible options are retention of first watering/storm water; retention of rice flood water to allow in place dissipation; recirculation of drainage water; dilution of contaminated water with uncontaminated water; diversion to off-site storage, and more precise aerial application in order to avoid overspray and spray drift.

Star of the show: a cousin of the waterflea used as an indicator of the biological impact of pesticide residues in channel water



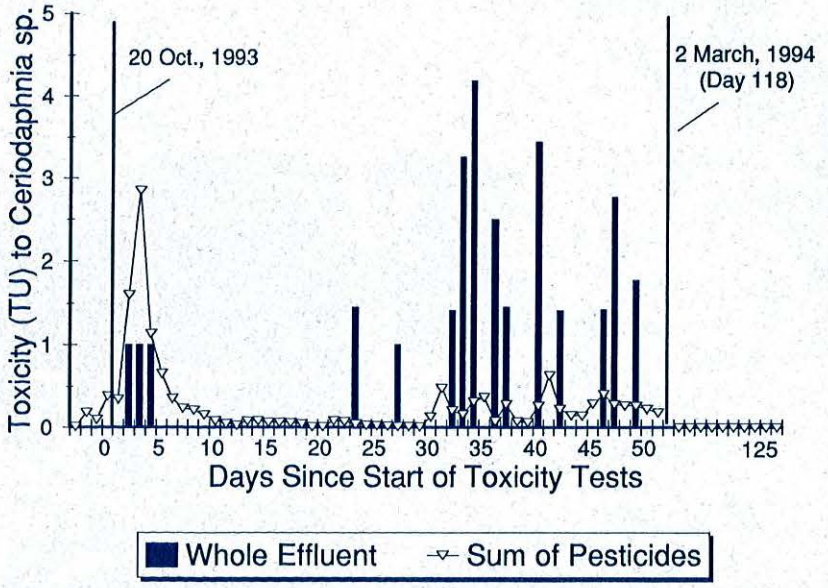
SOME RESEARCH FINDINGS

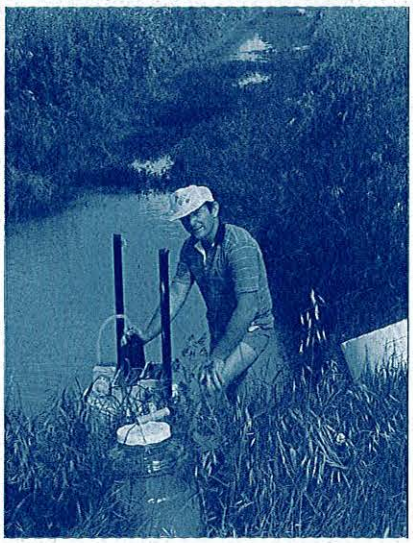
TOXICITY OF PESTICIDES (TO WATERFLEAS) WHEN TESTED IN MIA SUPPLY WATER

The table below shows the toxic concentrations (LC_{50}) of various pesticides determined in MIA water supply, compared with the concentrations regarded as safe for ecosystem protection and for drinking water

Pesticide	Ecosystem protection	Drinking Water	Toxicity (LC_{50}) MIA Supply
Chlorpyrifos	0.001	10	0.25
Malathion	0.07	50	1.44
Molinate	2.5	5	430
Atrazine	2	20	18300
Metolachlor	8	300	1950
Thiobencarb	1	30	260
Glyphosphate	65	1000	7990
Diuron	8	40	not available
Bromacil	750	600	not available
Bensulfuron	100	not available	>30000

PREDICTED TOXICITY (TO *WATERFLEAS*) OF WHOLE DRAINAGE EFFLUENT DUE TO ADDITIVE EFFECT OF ALL PESTICIDES DETECTED BY CHEMICAL ANALYSIS (LINES) VERSUS OBSERVED TOXICITY (BARS).





The photo shows Geoff McCorkelle taking samples in a typical drain of the MIA. The samples are then taken back to the laboratory for toxicity testing and chemical analysis.

For further details on the results of this project, contact:
Dr Wolfgang Korth
CSIRO Division of Water Resources
Griffith Laboratory
Private Bag, PO Griffith
NSW 2680
Phone (069) 601 500
Fax (069) 601 600

Land & Water Resources
Research & Development Corporation