



WaterWheel

NATIONAL PROGRAM FOR IRRIGATION RESEARCH AND DEVELOPMENT
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EDITORIAL

The first phase of the National Program for Irrigation Research and Development (NPIRD) is drawing to a close, and the Program Management Committee is busy planning for the second stage. The two most important tasks are first, to determine the priorities for the on-going program, and second, to secure the funding to put the new program into action.

The Committee is preparing an issues paper which will be widely circulated for discussion before a workshop in March 1996. The outcomes of the workshop will determine priorities for the program.

LWRRDC has committed \$600,000 for three years, provided that this is matched by the irrigation industry. Queensland Department of Primary Industries has indicated that it is prepared to support the program, and will be represented on the management committee by Bill Eastgate, acting Director of the DPI Resources Management Institute, and a representative of the

Queensland Irrigators Council. We are currently awaiting advice from our other program partners and possible new partners, as to their commitment.

The Irrigation R & D program operates within the framework of LWRRDC's mission (see below). The cost-sharing arrangements reflect the distribution of benefits from the research program between the community as a whole, irrigation agencies and individual irrigators.

NPIRD has been well-managed during its establishment phase, thanks to Dr Peter Chudleigh, who has recently stepped down as Chairperson of the Program Management Committee. Peter will remain on the Committee as a LWRRDC representative.

We encourage readers of WaterWheel to take an active part in the development of priorities for the future program, and seek your support for ongoing funding of the program.

Christine Forster
Chairperson,
NPIRD Management Committee

This publication is supported by the Land and Water Resources Research and Development Corporation, PO Box 2182, Canberra ACT 2601 Phone (06) 257 3379.

LWRRDC's mission is to improve the long term productive capacity, sustainable use, management and conservation of Australia's land, water and vegetation resources through a directed, integrated and focused research and development effort.

Ms CHRISTINE FORSTER, NEW CHAIRPERSON, NPIRD COMMITTEE



Christine Forster

Christine Forster was originally trained as a microbiologist, graduating from the University of Melbourne in 1959. She became involved in the water industry when she moved to Darwin in 1966, establishing the bacteriological laboratory for the then Northern Territory Administration.

Her practical experience in the NT included many aspects of water quality (chemistry and bacteriology) in respect of water supplies for towns and settlements, export abattoirs and irrigation as well as the impact of urban development and mining on waterways.

Christine moved to Canberra in 1971, worked on water quality in the Australian Water Resources Council secretariat, was secretary to the Lake Pedder Enquiry and was involved with the River Murray Working Party which

Ms Christine Forster replaces Dr Peter Chudleigh as the Chairperson of the NPIRD Management Committee. We thank Peter for his efforts in establishing the Committee.

recommended extension of the River Murray Waters Agreement to include water quality. In 1976, Christine acted as Director of the newly established Heritage Commission.

On returning to Victoria and the family farm, Christine was appointed to the Board of the newly formed Rural Water Commission in 1984 and chaired the Board until 1990. She remained a member of that Board and its successor, the Rural Water Corporation until 1995.

Christine was a member of the Australian Water Research Advisory Council and helped establish the National Irrigation Research Fund in 1987. NIRF developed the Irrigation Research Strategy which formed the basis for the first phase of the LWRDC Irrigation Research program.

She is currently a member of the Catchment and Land Protection Council of Victoria, and a Director of both LWRDC and the Australian Fisheries Management Authority.

VALE SCOTT McLEAN

The irrigation industry in Australia suffered a great loss in October, when Scott McLean, his partner Don Idemer and a colleague were killed in a light plane crash at Warrnambool in Victoria.

Scott and Don were partners in Aquafield-McCracken, a leading supplier in the eastern states. Together they helped to establish the Irrigation Association of Australia.

Scott made a great contribution to the irrigation industry. As President of IAA he played a key role in the establishment of the Australian Irrigation Council and supported the development of the National Irrigation Council.

The NPIRD committee extends sympathy to Scott and Don's families and shares in their loss.

17TH NPIRD MANAGEMENT COMMITTEE MEETING: 19TH OCTOBER 1995

COMMITTEE MEMBERS

Peter Chudleigh (Chair)	LWRRDC
Christine Forster	LWRRDC
Peter Noonan	QDPI
Mike Bennett	NSW
Steve Mills	Victoria
Richard Wells	Victoria
Nick Schofield (Program Manager)	LWRRDC
Dave Wesley (Program Coordinator)	LWRRDC
Geoff Wright	NSW
Peter Bevin	QDPI
Noel Dawson	QDPI

ELECTION OF CHAIRPERSON

Peter Chudleigh confirmed his intention to step down from the Chair. He has held the position for the last two and a half years, guiding the Committee through the establishment phase of the NPIRD. Peter stood down at this time to facilitate the development of a good working relationship between the incoming Chairperson and the recently appointed Coordinator, and to have continuity leading into the second phase of the program.

Christine Forster was elected to the Chair unopposed. Peter Chudleigh will remain a LWRRDC representative on the Committee.

DEVELOPMENT OF NEW PROGRAM PRIORITIES

The Committee has agreed that an issues paper should be prepared as a basis for setting new program priorities for the five year phase commencing in July 1996. The paper will be prepared by consultants and will take account of discussions with groups and organisations involved in the irrigation industry. The issues paper will then be the focus for a national workshop from which will emerge the new NPIRD priorities for the second phase of the program.

TECHNOLOGY ADOPTION AND EDUCATION

The processes and rates of technology adoption are important aspects of LWRRDC funded projects. For some time the Committee has been considering ways of evaluating these issues across projects.

The Committee has decided to set up a workshop in 1996, with a view to assessing the various factors affecting technology adoption across five projects which have been funded by LWRRDC, and to investigate methods for improving the rates of technology adoption within the irrigation industry.

NEW POSTGRADUATE SCHOLARSHIP PROGRAM

The Committee was concerned about the limited research capacity in irrigation sustainability in Australia, and the need to develop expertise in this area. It was agreed that provision be made for the inclusion of a funded program for postgraduate research scholarships in the second phase of the NPIRD.

LONG TERM SALINITY STRATEGIES

After a meeting in Tatura to discuss long term salinity strategies and a related Murray-Darling Basin Commission project, a proposal for a one year feasibility study on this subject is being revised. The study, to be undertaken in the Shepparton area, will focus on ways to continue to farm in the presence of salinity in the longer term, within a market-driven environment.

If the project is expanded after the one year pilot study, consideration will be given to including a NSW component.

INFORMATION FLOW

The *Streamline* database, jointly sponsored by LWRDC and the Urban Water Association of Australia, is an information source containing details of not only LWRDC 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.**

COMING EVENTS

1. NPIRD Workshop: Program priorities

Venue and dates to be announced

2. Short Course: Regional Catchment Management

Venue: University of Canberra

Dates: 5-7 May 1996

Contact: AWWA

Phone: (02) 413 1288 Fax (02) 413 1047

3. Irrigation Australia '96: Biennial Expo and Conference of the Irrigation Association of Australia.

Venue: Adelaide Convention Centre, S. A.

Dates: 14-16 May 1996

Contact: Jeremy Cape, Chairman

Phone: (08) 262 6311 Fax (08) 302 3373

4. Ozwater & Ozwaste Trade Exhibition

Venue: Darling Harbour, Sydney

Dates: 27-29 May 1996

Contact: AWWA

Phone: (02) 413 1288 Fax (02) 413 1047

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EDITING, DESIGN AND ARTWORK BY SALLY BERRIDGE

COAG WATER POLICY REFORMS: IMPLICATIONS FOR AGRICULTURE

COAG is the Council of Australian Governments. It consists of the Prime Minister, and the Premiers and Chief Ministers of all States and Territories, and the President of the Australian Local Government Association.

WHY ARE REFORMS NEEDED?

Irrigated agriculture brings substantial benefits to regional communities and to the nation as a whole. It has an annual production value of \$6 billion, representing 25% of all agricultural production. Irrigated agriculture also uses about 70% of Australia's harvested water resources.

It is vital that our water resources are managed so that they continue to meet the needs of a range of uses in both urban and rural areas. One important use of water, which has not been well recognised, is for environmental purposes – to preserve the well-being of river systems.

There is mounting evidence of significant environmental problems in many of our key farming regions and industries (such as rising water tables, increasingly saline groundwater and toxic algae). Also, there is a number of other fundamental issues confronting water resource management in rural areas, such as deteriorating infrastructure, limitations on funds available for refurbishment, barriers to water being transferred among users, inefficient service delivery, and poorly defined roles and responsibilities of a number of institutions involved in the industry.

Unless these problems are addressed, the range of uses that our rivers can support is likely to be severely curtailed, and many of our irrigated areas will face an uncertain future.

Governments across Australia have recognised that concerted action is necessary if these issues are to be tackled. In 1994 all Australian governments, through COAG, agreed to a strategic framework of reform to address the major pressures facing Australia's water industry and to move it to a more sustainable footing.

The reforms agreed to by COAG are wide ranging and complementary. All elements are important and bring responsibilities as well as very real opportunities for all stakeholders. – whether at the government, industry or individual user level. They include measures in relation to water pricing, water entitlements and trading, environmental requirements, institutional reform, public consultation and education, as well as research. Success in implementing the reforms will also rely on the cooperation and effort at many levels from all stakeholders.

The COAG framework is a broad-based and integrated package. When implemented, it will bring about necessary reform for the water industry in Australia. It will bring changes in the way we manage water, and will present both challenges and opportunities to water users and managers. Those who adapt to and participate most successfully in the process of change will be best placed to reap the benefits of the opportunities the changes will bring.

/over

IMPLICATIONS FOR IRRIGATED AGRICULTURE

The main implication from the COAG water reforms is that irrigators will be able to assume greater responsibility for management of their water use. This will bring real opportunities for those irrigators willing to take them up. The reasons for this are explained below.

WATER IS LIKELY TO COST MORE, BUT THE BENEFITS FROM ITS USE WILL BE GREATER.

The new principles for water pricing are aimed at recouping business costs, as well as providing for infrastructure refurbishment or replacement. (In most Australian irrigation areas, water prices fall significantly short of meeting maintenance/refurbishment costs, and providing a return on capital investment.) The reforms will therefore provide greater security for irrigators and their long term needs.

It is inevitable that the reforms will result in higher prices as users pay the full cost of the water they use. However, institutional reforms in some areas have already reduced delivery costs significantly, partially offsetting the increases.

For many irrigators this means they will need to manage their businesses to use less water, use it more efficiently, or use it in a more profitable manner. Thus whilst water may cost more, there is scope for increasing the net returns from its use.

It is important to emphasise that the principles of cost recovery will be applied across the board, to all sectors of the community, not just irrigators.

WATER RIGHTS WILL BE EXPLICIT, SECURE AND TRADEABLE

The COAG framework requires clear specification of water allocation rights, in terms of ownership, volume, reliability, transferability and (if appropriate) quality. Separating water property rights from land title and redefining water as a tradeable commodity will help ensure that water will be transferred to higher value uses, maximising benefits to the community as a whole.

Farmers will therefore be able to both buy and sell water through a water market, subject to the social, physical and ecological constraints of catchments. They will be able to buy extra water to maximise returns and increase profitability. It will also help

restructuring by assisting those who wish to leave the industry to do so through the sale of their water rights.

FARMERS WILL HAVE MUCH GREATER CONTROL OVER THEIR AFFAIRS

The COAG framework proposes that water resource management, standard setting and regulatory enforcement, and service provision be separated. This will provide an opportunity for water users to exercise more control over their affairs and increase their involvement in the management of water resource use at the local level.

Responsibility for water management will in many cases be devolved direct to user groups. This is already happening in many States, where farmers are increasingly taking responsibility at the local level.

IMPLEMENTING THE REFORMS

COAG has set a five to eight year period for implementation of the reforms, because the changes are so far-reaching. The overall target is the year 2001. Part of this process will involve governments consulting with the community on aspects of the framework.

Governments recognise the difficulties that many regions face in adjusting to the reforms, and in partnership with local communities, are providing assistance to regions, to enable them to develop effective plans for the future.

For example, both the Shepparton and Sunraysia areas have benefited from government assistance to support the development of irrigation infrastructure in accordance with regional development objectives. Through the National Landcare Program, governments are also supporting the South Australian Highlands Irrigation Area to address sustainability issues. This initiative includes infrastructure rehabilitation and complementary measures addressing land and water reforms, to enable the region to become more competitive and ecologically sustainable.

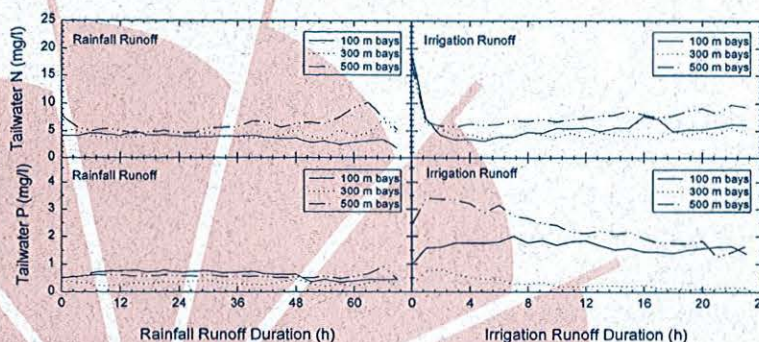


INTERIM REPORT: TOWARDS REDUCED FERTILISER LOSS IN IRRIGATED PASTURES

PROJECT DAV 12 ENVIRONMENTALLY SUSTAINABLE FERTILISER USE THROUGH IMPROVED FLOOD IRRIGATION MANAGEMENT TECHNIQUES

This project, located at the Institute of Sustainable Irrigated Agriculture, Tatura, Victoria, has one more year to run, but an interim report has already shown some interesting results. The principal investigator is Mr Nick Austin, and the project is being carried out in the Shepparton Irrigation Region (SIR) of Victoria.

Figure 1: Typical nitrogen concentration in tailwater following rainfall and irrigation



BACKGROUND

Irrigated pastures contribute significant loads of both nitrogen (N) and phosphorus (P) to inland waters in the SIR. This is not only a waste of fertiliser, but it contributes to the growth of water weeds, and can also lead to the formation of costly, inconvenient and potentially toxic algal blooms. Reduction in the nutrient load from irrigated pastures is therefore desirable, and can be achieved both on and off the farm. Tackling the problem at its source (ie on-farm) will reduce downstream environmental impacts, while increased fertiliser use efficiency can improve farm profits.

PROJECT AIMS

The general aims of the project are:

- to measure levels of N and P runoff from irrigated perennial pastures after fertiliser application;
- to determine and demonstrate irrigation management methods that minimise or eliminate nutrient runoff after fertiliser application, and also minimise deep percolation losses of fertiliser;
- to establish penetration uniformity of fertiliser into soil on irrigation bays, and
- to produce guidelines for water management practices that promote efficient fertiliser use on-farm, and reduce downstream environmental impacts of fertiliser application.

PROJECT OUTCOMES

Fig 1 shows that nitrogen concentration is higher in irrigation induced runoff than it is after rainfall. However, both N and P show a 'first flush' effect, where initial tailwater concentrations are markedly higher than those later in the runoff event. The concentration of nutrients in tailwater (surface runoff) remains relatively constant even though discharge may vary considerably.

Some other work has shown that nutrient concentration in tailwater from different soils such as reclaimed swamp land are similar to those shown above.

MANAGEMENT TO REDUCE NUTRIENT LOSSES FROM IRRIGATED PASTURES.

The total amount of nutrient loss is the product of the volume of tailwater, and the nutrient concentration of that tail water. Minimising nutrient loss is therefore dependent on the reduction of both these factors.

REDUCING TAILWATER VOLUME

It is important to reduce tailwater volume in *all* irrigation events, but it is crucial for the two irrigations following fertilisation, when tailwater concentrations are markedly higher.

AUTOMATIC IRRIGATION

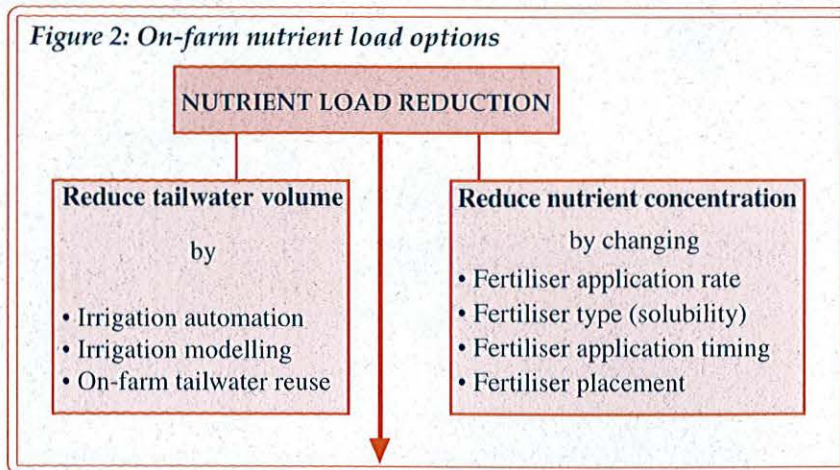
Automatic systems have mechanical opening and closing of channel checks or bay outlets. Automation can represent significant labour saving, but concerns over reliability have limited uptake of this technology.

The use of computers in irrigation modelling has been studied for many years, but it is only relatively recently that a simplified model has been developed to assist in choosing optimum discharge and duration times.

FERTILISER SOLUBILITY

Irrigation water applied after application of highly soluble fertilisers rapidly attains high nutrient concentrations. Less soluble fertilisers are being investigated to see whether

Figure 2: On-farm nutrient load options



they can reduce the nutrient load in tailwater, while maintaining soil nutrient status.

Whether fertiliser is applied in one application

or split applications, the total load of nutrients to the tailwater remains identical for a given fertiliser application rate.

Below: Rachel Dick, project leader, is probing and taking gravimetrics in order to determine soil water content



For further details on the results of this project, contact:

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