NATIONAL PROGRAM FOR SUSTAINABLE IRRIGATION

Research projects 2007-2011

New Ideas for Irrigation

Our Vision

Australian irrigation that is valued for its environmental, economic and social contribution

Goals and Outcomes

Goal 1: Sustainable production in a water scarce environment

Improved irrigation water use efficiency and enhanced ability to respond to changing levels of resource availability over time.

Water scarcity is a significant sustainability issue for Australian Irrigation now and into the future. Research is needed to assist irrigation industries to adapt to increasing variability of supply, increasing competition, reduced allocations and increasing pressure on water quality so that irrigators can modernise their practices in a way that is environmentally, socially and economically sustainable.

Goal 2: Sustainable Futures and the Environment

Reduced environmental impacts, more sustainable ecosystems and more prosperous communities.

Sustainable water use in Australia must encompass economic, environmental and community needs. Water supplies have to cope with change, ranging from drought to flooding rains. Changes to irrigation systems will also have environmental implications. These need to be understood at the farm and landscape scale.

Goal 3: Knowledge into practice

Improved skills, knowledge and decision making of end users which leads to practise change, and more efficient and sustainable use and management of water

R&D projects do not serve their purpose unless their findings are delivered to end users and put into action. In many cases the research has been done and technical options have been developed, but they have not been adopted by end users. In other cases, the R&D environment provides a non threatening process and the facts to accelerate implementation of on ground change.

Goal 4: Research & Development Leadership

A national approach to irrigation related R&D in Australia, which includes a strong focus on a skilled human resource base and enhanced R&D capacity and collaboration.

The irrigation industry has many diverse organisations and interest groups from the public and private sectors. National leadership for Irrigation R&D that leads to accelerated and efficient implementation is required.

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Current research and development projects

Root zone water, salinity and nutrient management
Dr Tapas Biswas

Managing root-zone water, nutrients and salinity through supplementing winter rainfall leaching with irrigation.

Open hydroponics irrigation in citrus
Dr Tapas Biswas

Understanding solute dynamics under advanced fertigation systems to assess the short and long term implications of this system compared with conventional growing systems.

Long term sustainability of precision irrigation
Dr Rob Murray

Establishing soil management strategies for drip irrigated vineyards in the Barossa Valley by assessing the impact of drip irrigation on soil and establishing the role of soil type and irrigation water in contributing to soil structure issues.

Optimising delivery & benefits of aerated irrigation water
Prof David Midmore and Dr Surya Bhattari

Developing a training manual and decision support tool for implementing oxygation in perennial crops in QLD, NSW and SA to increase crop yield and quality by overcoming root oxygen starvation caused by irrigation.

Managing soil salinity for wine quality in groundwater-irrigated vineyards
Dr Michael McCarthy

Developing strategies to adapt wine grape production systems to the prevailing soil & climatic conditions, groundwater flow & quality regime and irrigation technology to achieve premium wines that meet world food health standards and ensure export growth.

Soil management for Australian irrigated agriculture
Dr Bruce Cockroft

Developing new soil preparation and management practices enabling large inputs of stable soil organic matter, through incorporation of stable soil sheaths (rhizosheaths) formed on ryegrass roots, to increase the water use efficiency and productivity of irrigated crops.

Channel evaporation mitigation
Mike Schulz

Assessing the effectiveness of monolayers in closed and flowing irrigation channels to reduce evaporation losses.

Quantifying surface water - groundwater exchange using thermal & chemical measurements
Prof Ian Acworth

Developing an integrated measuring tool to quantify surface water - groundwater transfer to aquifers beneath river beds to enable mapping of the many and complex connections and interactions between groundwater and the surface water - dams, lakes, rivers, wetlands.

The effect of changing irrigation strategies on biodiversity
Dr Sue McIntyre & Dr Tony Arthur

Identifying how irrigation practices effect local and regional biodiversity, and exploring strategies to ameliorate any negative effects of predicted changes without further compromising environmental sustainability.

Farm dam management
Deb Atkins

Developing and delivering integrated farm dam management information training to allow irrigation businesses to optimise the use and returns from irrigation dams.

Adaptive learning through five strands of root-zone knowledge

Dr Richard Stirzaker

Demonstrating how the collection of five independent strands of irrigation data via a novel sensor and logging platform will link irrigator experience with measured data, link atmospheric scheduling with soil based monitoring, and link water management with solute management.

Review of precision irrigation technologies & their application

Prof Rod Smith

Developing a framework to guide research, development and adoption of precision irrigation as part of a precision agricultural system.

Management of irrigation water storages: carryover rights and capacity sharing

Tim Goesch & Neal Hughes

Investigating the potential of carryover rights and capacity sharing to generate superior outcomes to central control of storages and developing a model to quantify the potential benefits from adopting decentralised storage management policies.

Knowledge and tools to manage fertigation technologies in highly productive citrus orchards for minimal environmental footprint

Dr Michael Treeby, Dr Tapas Biswas, and Steven Falivene

Developing and delivering the knowledge and tools needed for sustainable and economic citrus production using high frequency fertigation technologies.

Water Smart Cotton and Grains in NSW

Deb Slinger & Dr Janelle Montgomery

Delivering irrigation training, farm walks and technology demonstrations to increase knowledge transfer and encourage the adoption of irrigation best practices to improve WUE. Water use indices will be calculated for both the cotton and grains industries.

Informing future irrigation and water management at the Ord River, Western Australia

Anna Price

Synthesising opportunities afforded and resources required to pursue accreditation as a HELP (UNESCO-IHP HELP Program) basin through lessons learned from other Australian HELP basins, including the Murrumbidgee and Lower Burdekin.

NPSI/IAL Travel Fellowship

Each year NPSI provides a $10,000 travel fellowship for someone involved in the irrigation industry to provide for overseas travel to study issues related to sustainable irrigation and in bringing their findings back to Australia providing the winner with an opportunity to develop their local knowledge and industry networks.

Undergraduate Student Scholarships

The scholarships enable university students to conduct short research, extension or industry projects under the direct supervision of a researcher or extension officer from either the public or private sector to encourage undergraduate university students into the irrigation industry.

Groundwater and surface water interactions in Western Australia
Dr Fionnuala Hannon

Using techniques that include water balance modelling, baseflow separation modelling and Darcy's Law, this project will analyse existing gauging data and groundwater data to quantify the status of each resource and describe the interactions between the resources.

Quantifying surface water and groundwater exchange
Prof Ian Acworth

This project is developing field equipment and a proven scientific methodology to quantify surface water - groundwater transfer to aquifers beneath river beds and therefore contribute to the mapping of the many and complex connections and interactions between groundwater and the surface water.

Upskilling water managers on expert systems for vegetables
Jim Turley

This project will focus on the implementation of the Vegetable Irrigation Scheduling System (VISS) to the vegetable industry principally on coastal plain sands in Western Australia to help increase irrigation scheduling efficiency and water management through using real time weather data and crop factors in a web based computer system.

Preparing irrigated agriculture for statutory and climate change
Dr Mark Gibberd

The aim of this collaborative project is to improve the long term viability of irrigated enterprises in Western Australia by increasing their capacity to effectively assess requirements, manage and secure adequate water resources under the pressures of current statutory change and predicted climate change.

New technologies to reduce evaporation from large water storages
Prof David Solomon

This project is developing new technological solutions for evaporation control from large on farm water storages.

Increasing the resilience of Eastern Australian irrigated farm businesses
Dr Daniel Rodriguez & Dr Don Gaydon

This project aims to help irrigators achieve more efficient and sustainable enterprises as they adapt to reduced water availability, by investigating alternative irrigation and agronomic strategies for irrigators in the southern & northern NSW and Darling Downs.

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