

Irrigation *update*

sustainable irrigation

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Reclaimed 'Class A' treated water has the confidence of growers, however a new research project has been implemented to address food safety concerns and ensure best practice is implemented.

Confidence in reclaimed water

A survey of horticultural growers and wholesalers using irrigation water from the Virginia Pipeline Scheme, on the Northern Adelaide Plains in South Australia, was undertaken in early February 2005. A generally high level of satisfaction with using the Class A treated recycled water coming from the Bolivar wastewater treatment plant was found among the 75 interviewed.

"Reclaimed water – yippee!" was one grower response, after five years of experience in using the water for irrigation.

Growers believe that the scheme has "brought people back into the district" and "made growers drought-proof and sustainable". The survey found that most growers are satisfied and confident that Class A recycled water poses no health problems. Growers did need to manage the salinity levels of the water to grow the crops they wanted to, with 59% of them shandyng water

to decrease salinity levels some of the time. Nutrient levels in the water and other contaminants have not been found to be a problem. The water is only used for irrigation, not for washing and preparation of produce for market.

There is also routine testing to ensure that food safety is not compromised. For the growers in SA, it seems that it all comes back to being able to assure the buyers about the quality of their produce. One of them explained in the survey "...we do testing not only on water but on produce. More so on produce than on water. We find that by testing the produce we are cancelling out a lot of scenarios."

To ensure that food safety and longer term environmental concerns are addressed and communicated, and best practices are routinely implemented on farm using recycled water, a project

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Using science to defuse a silent time bomb - salinity around the root zone.

Addressing the silent time bomb

Research and advances in technology have made it possible for irrigators to be highly water efficient – using only the amount of water necessary to maximise crop yield. However using less water can lead to a build up of salt around the plant's root zone, eventually impacting on soil health and productivity. This means larger irrigation volumes may need to be applied to remove the salinity, resulting in lower irrigation efficiency.

Researchers and advisers in the irrigation sector recognise that more work needs to be done to pinpoint leaching efficiencies so that soil and irrigation management on-farm can achieve production results and river salinity targets. What amount of water needs to be applied for maximum yield, to maintain soil health and to meet the imperative that drainage water not increase the discharge of salt into rivers?

A research project commissioned by the National Program for Sustainable Irrigation has already led to some scientific breakthroughs in these areas. As part of the project, a large research team is working across three States to investigate risks related to root zone salinity for horticulture in the Lower Murray.

Led by Dr Gerrit Schrale from the South Australian Research and Development Institute (SARDI), the team is working both in the field and the laboratory to investigate leaching processes and validate the

predicted consequences for salinity sensitive crops.

A preliminary survey of 14 properties has already indicated that salt displacement from the root zone by leaching is less than expected; although there is a wide range of results.

“In this kind of crucial research, it is usual in the beginning to keep finding more questions than answers,” said program coordinator Murray Chapman. “This research is spot on and quite exciting because we have the opportunity to focus on answering questions and finding practical solutions for irrigators, water authorities and policy makers.

“For example, the research team needed an easy but reliable tool to extract soil solutions for determining the chemical composition of soil water available for plant uptake. There wasn't one, so they invented a solution extractor tool that will be extremely handy for irrigators as well as other researchers.” Forty-eight of the new extractors are now being used at four vine and citrus calibration sites in South Australia, New South Wales, and Victoria.

New information from the research will be made available as it comes to hand over the next two years. To view the latest, visit the National Program for Sustainable Irrigation website www.npsi.gov.au.

About the NPSI knowledge base

The National Program for Sustainable Irrigation has created a database of relevant research reports that can be accessed from the program's website at www.npsi.gov.au. There are about 270 references in the Knowledge Base, and the list just keeps growing!

In compiling the database Australian research, and research commissioned by the Program and its funding partners, has been used as a starting point.

The key criterion for research to be included in the database is its relevance to sustainable irrigation.

Summarised reports and, where possible, links to each of them, have been supplied. Each report is discussed under one or more of the following headings:

- relevance to irrigation;
- guidelines and toolkits – computer models, tools and any explicit guidelines;
- efficiency and profit – on-farm practice;
- environment – off-farm research and practices; and
- public policy – macro-economic issues and communication approaches.

In addition, each report has been categorised by its relevance to one or more broad sectors of the irrigation community:

- catchment;
- horticulture;
- broadacre; and
- extension and knowledge exchange.

These headings partially refer to the scale at which the research is targeted, and the activity it covers.

Much of the material is linked to more than one category. A simple matrix of the above categories provides a fast way of getting to a relevant sub-set of research. Alternatively, an 'author' or key word search may be undertaken.

The website represents a distillation of Australian irrigation research, with a particular focus on the 'grey' literature that often has a great deal of practical information that may not be suitable for referenced publications.

Try searching it next time you have a question about irrigation - www.npsi.gov.au, then go to the Knowledge Base.

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Got a question about irrigation? The National Program for Sustainable Irrigation database contains references and links to more than 270 research reports relevant to sustainable irrigation at www.npsi.gov.au, then go to the Knowledge Base.

coordinated by the National Program for Sustainable Irrigation was developed. The *Use of Recycled Water in Australian Horticulture* project is focusing on:

- guidelines for recycled water scheme development and use;
- perceptions of recycled water in irrigated horticultural production;
- information to implement safe and sustainable management practices;
- processes to ensure dissemination of information and knowledge accumulation.

Findings from the National Program for Sustainable Irrigation project have facilitated the development of a Victorian Department of Primary Industries funded project, managed by the same team of researchers.

“This project has been established to confirm for Victorians that the health and environmental risks of using Class A recycled water to irrigate market garden produce are insignificant. It will provide the ‘definitive proof’ that produce grown with recycled water is as good as any other produce grown with traditional sources,” said Dr Boland.

The project has established strong links with the Horticulture Australia communications project, Coordinator Recycled Water Development in Horticulture, which has established a web site for people to obtain information on recycled water projects around Australia - www.recycledwater.com.au

For further information on the project please contact the NPSI program coordinators Murray and Liz Chapman on (03) 5763 3214, email: rplan@benalla.net.au; or Dr Anne-Maree Boland on (03) 9210 9222, email: anne-maree.boland@dpi.vic.gov.au.

Open Hydroponics - a new approach to intensive orchard management

The possibilities for intensive orchard management have expanded with the development of a new approach called ‘Open Hydroponics’.

Open Hydroponics aims to increase yield and fruit quality of horticulture crops by using drip irrigation up to nine times during daylight hours, so that the soil never dries out when the plant needs the water most.

Normally hydroponics are used in glass houses, where plants grow in water and are held up by string. Open Hydroponics is an adaptation where the plants are grown outside, and soil is used to support the plants, but all the needs of the plant are supplied by irrigation and liquid fertilisers.

The ideas behind Open Hydroponics are:

- the active root-zone is limited to a small wetted soil volume – this is done by reducing the number of drippers per tree so that the roots don’t need to spread out through the soil;
- a balanced nutrient solution is continuously applied at a precise pH level;
- the soil around the roots always stays very wet – this requires the use of soil

moisture monitoring equipment and the installation of specialised drip systems that can switch on 6-9 times per day, or even stay on all day in very hot conditions.

The National Program for Sustainable Irrigation and the CRC for Irrigation Futures are investigating Open Hydroponics. The first stage of the project is researching:

- a typical Open Hydroponic situation, which can be used in assessment studies;
- conducting a salt/nutrient water balance of a typical orchard (eg soil pH, nutrient leaching, efficient and inefficient irrigation practices and rainfall);
- discussing the problems of a continuous supply of water with water suppliers;
- ecological risk assessment of the possible risks and hazards associated with Open Hydroponics.

The project team consists of Steven Falivene (Principal investigator), Ian Goodwin, David Williams and Anne-Maree Boland. For more information contact Anne-Maree Boland on (03) 9210 9222 or visit www.npsi.gov.au

The National Program for Sustainable Irrigation is managed by Land and Water Australia on behalf of the partners. The partners include irrigators, water authorities, research agencies, state and Commonwealth departments and commodity groups. For information about becoming involved in the Program, please contact:

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