Showcasing new technology

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- A range of new irrigation technologies was showcased to irrigators in the Murrumbidgee Valley at field days organised by the IREC Irrigation Technology Subcommittee – keep a look out for more fields days in 2009

With the formation of the IREC Irrigation Technology Subcommittee (ITSC) in late 2005, came the charter to host field days and workshops showcasing new irrigation technologies. Over the past three years a number activities have been organised to illustrate some of the innovations in the irrigation industry.

This article looks at the technologies and innovations showcased in February 2008 at the Coleambally Community Demonstration Farm, also called the Demo Farm.

Total channel control

Like most farm holdings in the Coleambally Irrigation Area, the Demo Farm has a FlumeGate™ structure supplying its irrigation water. The FlumeGate is one component of the Total Channel Control (TCC™) system developed by Rubicon Systems Australia Pty Ltd. Rubicon believes that TCC has revolutionised the way open channel irrigation systems operate.

Coleambally Irrigation Cooperative Limited (CICL) too believes TCC™ is the way of the future, so much so that it has replaced all the old channel regulators with the new system and is in the process of replacing all the Dethridge outlets with FlumeGates. Total Channel Control involves the installation of automatic gates, communication networks and advanced control and management software. This integrated package enables open channel systems to supply water close to "on demand".

The main physical component of the TCC system is the FlumeGate shown in Figure 1. The FlumeGate is an integrated gate and control product designed specifically for regulating and measuring flows. They can be retrofitted into an existing Dethridge meter outlet and Rubicon states that the FlumeGate is capable of controlling flows within an accuracy band of +/– 0.2 ML/day even when upstream and downstream water levels vary.

Like most irrigators around the district the Demo Farm was without an allocation in 2008. CICL generously donated some water in order for trials to continue in 2008. It was decided to trial growing maize on the relatively new beds in a bankless channel layout. CICL employees also worked at automating the system so as to link it in with the TCC and FlumeGate technology.

The lasered contour bays had zero side fall (from bank to bank), 1:5000 fall down the bay and were terraced with a 7 cm step between each bay. The 1.8 m beds were formed-up inside each bay, to run parallel with the bank (running north-south). A bankless channel was formed at each end of the bay, so that the supply spilt in two and watered the 500 m long bays from each end.

Ian Sutherland, Demo Farm chairman, said he had his doubts whether the 7 cm terracing would work, but it did. At 12.9 t/ha yield with 9 ML/ha water use, Ian believed they worked very well. He does feel that the 7 cm terrace was perhaps a little too low and would like to try the layout with a bit more of a step (10–15 cm).

Automatic stops

John Padman of Padman Stops was also on hand to show how pneumatic controllers work to open and close the "Padman

Figure 1. *A FlumeGate™, which is an integrated gate and control structure designed specifically for regulating and measuring flows of water on to farm.*

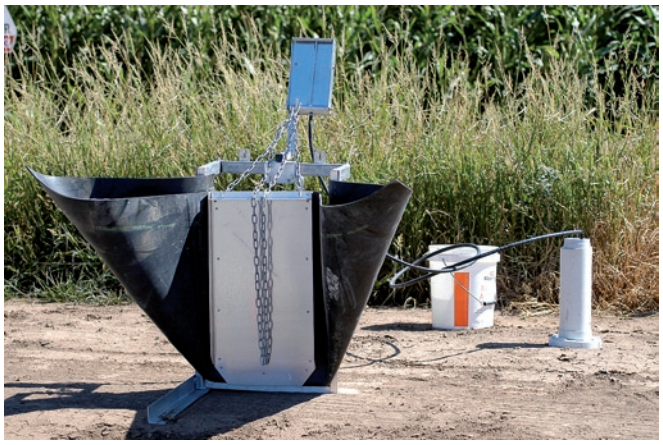

Figure 2. A "Padman Stop" with a pneumatic controller for opening and closing the stop automatically. The controller is connected to an air tube and responds to a relative level of water in the tube.

Figure 3. IrriMate siphon meter used for performing in-field evaluations of water behaviour in furrow irrigation layouts.

Stop", which John designed and manufactured over 20 years ago (Figure 2).

The Padman Stop is a 100% watertight rubber flap set in a concrete structure. The pneumatic controller is a permanent controller for opening and closing of stops and is connected with an air tube to a sensor down the bay. The automated stops are popular in border check layouts on many dairy properties in southern NSW and northern Victoria.

In order to automate the stops at the Demo Farm, CICL employee Daniel Whittred has been working to customise the Padman sensor used to trigger the controller. Daniel has trialed the "FullStop wetting front detector", a funnel shaped device that is buried in the root zone. Once the wetting front fills the funnel with water, it triggers an indicator to pop up. Daniel has been working on modifying the FullStop so that in place of the indicator, a radio message can be sent to the pneumatic controller to open the stop.

The ultimate goal is to link the FullStop and Padman controller to the TCC so that it can all be monitored and accessed remotely.

Monitoring crop water needs & use

In the final presentation of the day Paul Hudson from Cropsol talked about the weather station installed at the Demo Farm which is linked to other sites around Coleambally. The purpose of the weather stations is to better gauge plant water use across the district based on weather data.

Also demonstrated were two of the more popular soil moisture monitoring tools in use, these being the G-Bug with a Hanson logger and the more sophisticated capacitance probe. Both of these record and store soil moisture data. The Hanson logger has an easy to read display which can be read out in the paddock, while the capacitance logger can store more readings but must be downloaded to a computer to see the soil moisture readings.

Irrimate™ tools used in performing in-field evaluations of furrow irrigation layouts were also on display. The tools used include siphons with a meter attached (Figure 3) which give an accurate reading of the flow rate into each furrow, advance meters which are placed at various intervals down the length of the row, which give the time taken for water to flow down the furrow and lastly the drainage flume which has a meter attached and measures the flow of water out the end of the furrow.

By studying the behaviour of the water advance and recession, alternative management decisions can be made, which will improve the application rate and reduce drainage. In one case, savings of 0.2 ML/ha were made for each irrigation which added up to an impressive water use of 1.4 ML/ha over the season.

Water into wine

In April 2008, the Irrigation Technology Subcommittee and CSIRO Griffith held the "Water into Wine tour". Nick Car, CSIRO PhD student, introduced the innovative use of mobile phone SMS to deliver irrigation scheduling information (reported in *Farmers' Newsletter* No. 179). John Hornbuckle, CSIRO Griffith, spoke on dripper flow rate variability and its effect on vine performance. A block with distribution uniformity of 85%, on the low side of acceptable but common, can have irrigation applications ranging from 3 to 5 ML/ha and nitrogen application from 16–26 kg N/ha/yr. Ian Goodwin, Senior Irrigation Scientist DPI Victoria, spoke on the effects of irrigation, soil and canopy management on the finished product, which was sampled at the end of day to complete the understanding of impacts of vineyard management.

Showcases to continue in 2009

While IREC has scaled down its activities for 2009, the Irrigation Technology Subcommittee will continue its mandate to showcase new irrigation technologies to Riverina farmers and the broader community.

Further information

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