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LEADING EDGE

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EvapCalc3 detects sneaky seepages

By Gary Alcorn

Irrigation water is about to become both dearer and scarcer so growers are keener than ever to make sure every drop counts towards productivity.

Proven help to increase water-use efficiency is on the way in the form of a real-time software program called EvapCalc3, funded by CRC Irrigation Futures.

In the Northern Murray-Darling Basin study region, 75 per cent of the irrigated area is devoted to cotton. Other crops include pasture, lucerne, cereals, coarse grains, oilseeds and high-value horticulture.

An estimated 4500 GL of on-farm storage has been developed throughout the NMDB so any quantitative seepage detection system will make a critical contribution to enterprise viability.

According to development team head, National Centre for Engineering in Agriculture's (NCEA) director Erik Schmidt at the University of Southern Queensland, EvapCalc3 quantifies both evaporation and seepage losses.

"After two years of development we have refined the package to detect various sources of moisture loss from storages to within one mm accuracy," Erik said.

"Our plan now, subject to approval, is to use EvapCalc3 along with the Irrimate meters to monitor losses from 90 storages on cotton growing properties in two states as part of a National Water Commission program," he said.

Aquatech Consulting Pty Ltd in Narrabri NSW commercialised Irrimate and have been analysing data by hand since 2005. They have been working closely with NCEA and have recently checked EvapCalc3 on previous data analysed by hand.

Company principal Jim Purcell believes EvapCalc3 will make analysis easier and help pinpoint seepage losses and then enable producers to run accurate cost benefit analysis to help decide whether to treat the seepage or not.

Determination of water losses from seepage and evaporation is a two-stage process. Firstly the total losses need to be measured very accurately. Then an analysis package is required to split the total losses into evaporation and seepage components,

The Irrimate seepage and evaporation meter has been used commercially since 2005 to measure total losses accurately. To date a manual analysis of the loss data to link evaporation to weather data was completed by an Irrimate consultant.

EvapCalc3 is a computer package which takes the loss data from the Irrimate seepage and evaporation meter and weather data for the site and enables the total loss data to be broken up into the seepage and evaporation components.

"Growers must not only know how much water arrives at their front gate but be able to identify the ultimate fate of every drop, whether through evaporation, seepage, plant uptake or runoff losses.

"Up to 40 per cent of water can be lost in a typical farming operation. Now we can measure the various losses and determine exactly how much is lost through seepage," Jim said.

Irrimate seepage and evaporation meter.

Recent monitoring using the Irrimate Seepage and Evaporation Meters identified seepage losses ranging from less than one mm per day up to a staggering 57 mm per day from on-farm structures. EvapCalc3 will make analysis even easier.

By quantifying losses from individual storages using the Irrimate meters and EvapCalc3, growers will be able to calculate the break-even point of annual water loss versus the cost of repairs or re-siting each storage.

"Irrigators need real numbers for the water saved and the cost of remedial work before they invest in improved water use efficiency," Jim said.

When combined with the successful Irrimate packages commercialised by Aquatech, EvapCalc3 could be used in the near future to quantify actual annual water losses.

North of the border, Toowoomba-based FSA Consulting's Nathan Heinrich has been evaluating EvapCalc3 using existing data sets from two Darling Downs storages.

"We have been beta-testing this NCEA-developed software for the past two weeks and it seems to be working very well," Nathan said.

"EvapCalc3's algorithms combine all previous calculation methods in a user-friendly software package which replaces the previous spreadsheet method of seepage calculation," he said.

He is confident EvapCalc3 will have application Australia-wide and become the benchmark for seepage loss calculations.

"We will be able to see what's happening and what we have achieved in reducing seepage losses in farm dams," Nathan said.

For further information contact NCEA Ph: 07 4631 1871.