

## Saving water — how are we going?

By Jim Purcell, Director, Aquatech Consulting, Narrabri and Warren

All irrigation farmers are looking hard at their water availability and thinking of ways to stretch it further.

### WHAT DO WE KNOW?

Surprisingly little work has been done to benchmark water use efficiency over the whole farm. Most of us know how much water we pump from rivers and bores. Most also have some idea of our storage volumes. This allows rough checks of water status before and after each irrigation event.

This information is very useful and can be used to give a gross volume (including losses) of water used in an irrigation event. Unfortunately, many irrigators do not have reliable or accurate volume to depth information for their storages which can make these calculations misleading. The good news is that your friendly irrigation consultant can easily provide this information.

Knowing the gross amount of water used in an irrigation event is only the start. Assuming we have accurate volume to depth relationships for our storages and the

24 ▷



Flow meters in siphons provide vital information.

## ◁123...SAVING WATER — HOW ARE WE GOING?

flow meters on our pumps and bores are reasonably accurate, we may determine that, on average, we used 1.23 megalitres (ML) per irrigated hectare for our December irrigation. What does this mean?

If we have a reasonable idea of the average soil moisture deficit in the plant root zone before irrigation we can quickly compare this with the amount of water used. For

example, if the average deficit was 80 millimetres (mm) we know that  $123 - 80 = 43$  mm or 0.43 ML per irrigated hectare went somewhere other than irrigating the crop. In other words, the Farm Irrigation Efficiency (the combination of farm canal/drain and field application efficiency) for the December irrigation event was  $80/123 = 65$  per cent.

Of more importance, where did the 0.43 ML per hectare go and can we reduce that loss?

### HOW DO WE IMPROVE?

It is almost impossible to improve if we don't know where the losses are. The cliché, "we need to measure it to manage it" is very true.

The Irrimate system handles field application and has been available commercially now for four years. The service has now expanded into each cotton growing area. The Irrimate package includes measuring devices, computer software and data collection procedures, which allow the accurate measurement of the depth of surface (flood) irrigation application down the full length of the field.

Irrimate can even be used to trial changes to siphon flow rates and irrigation setting times to optimise irrigation application. The software is powerful enough to also simulate changes to run length and field slope, if necessary, to improve application efficiency.

Independent consultants in Emerald, St. George,



The Irrimate system includes measuring devices, computer software and data collection procedures.

Toowoomba, Goondiwindi, Moree, Narrabri, Wee Waa, Bourke, Warren and Hillston are currently providing the Irrimate service. Over-watering of between 0.1 and 0.25 ML per hectare per irrigation has been identified and eliminated using this service without yield losses. In fact, the cotton plants in the top 1/3 to 1/2 of some fields have also had reduced water logging with these changes — indicating a potential for yield increases if managed properly.

### WHAT'S NEXT?

Aquatech Consulting of Narrabri and Warren are presently working closely with the National Centre for Engineering in Agriculture (NCEA) at the University of Southern Queensland and others to develop and test equipment to directly measure both seepage and evaporation losses from storages and canals.

Once seepage and evaporation losses can be measured, the last pieces of the water jigsaw can be fitted. With reasonable weather data and a basic understanding of the soil water moisture status, a full on-farm water balance determination can be completed. Along with specialised measuring equipment, supporting software is being tested to allow farmers to run their own daily on-farm water balance. Watch this space!

Based on previous work by Dalton and NCEA (Cotton

Conference 2000) and commercial results from four seasons by Irrimate, potential water savings of around 20 per cent can be made by adopting this technology.

Further information on Irrimate, the list of consultants providing the service and the new equipment and software can be obtained from Jim Purcell of Aquatech Consulting, Narrabri on 02 6792 1265 or [jim@aquatechcon.com.au](mailto:jim@aquatechcon.com.au)



The depth of flood irrigation can be measured down the length of the field.