

Tracking water on irrigation farms

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Available water supply is the single most important limiting factor for irrigated crop production in Australia. Yet there are still very few irrigators who actively measure or monitor where their water is being used.

Normally, only two factors are known;

- How much water came in through the farm gate (bores, regulated and supplementary supplies); and,
- The area of crop that was grown.

There are very few irrigators who have accurate measurements of how much water was used by the crop and where the losses occurred.

Monitoring how on-farm water management affects water use is critical to improving whole farm water use efficiencies. Significant amounts of water can be lost through wetting up, evaporation and seepage in channels, drains, reservoirs and inefficient field irrigations. It

is only through a combination of measuring and calculating the water use that management techniques can be improved and water use efficiencies maximised.

A software package, WaterTrack, has been developed that calculates daily water balance over the whole farm. This provides an accurate calculation of water consumption in every element of the farm including fields, storages, channels and drains. Every inflow of water onto the farm is accounted for including rainfall which is further divided into effective rainfall in the root zone and rainfall runoff.

At any stage in the season, WaterTrack provides daily, up to date calculations of:

- Whole farm water use;
- Individual water use in every element of the farm (field, channel, drain, storage); and,
- Effective rainfall

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This provides valuable performance benchmarking of the farm and every element of the irrigation system.

A unique feature of WaterTrack is the ability to predict forward — answering the important question “Will I have enough water to get through to the end of the season or should I drop some area out?” This is achieved by modelling the farm based on historic weather data unique to the farm. By using weather data from the farm or SILO, a range of years (wet, normal, dry) can be tested. So an irrigator can determine which fields to crop to maximise production from the available water. Similarly, simulations of changes to:

- Farm infrastructure;
- Allocation levels; and,
- Water purchases/sales can be modelled to assess benefits.

The physical dimensions of the farm irrigation system (channel and drain lengths, storage size and field area) are setup once. At the start of each season the type of crop is entered for each field. Real time climatic data is used to calculate daily crop water use and evaporation. Seepage losses can either be measured or calculated.

When a field is irrigated, the volume applied to the field can be either a measured amount or the program will calculate flows from the size, timing, number and average head on the syphons. Each time a field is irrigated

the segments of the supply and drainage system needed for that field are activated and the wetting up, evaporation, seepage and volume returned to the reservoir is calculated automatically for each element.

This technology is the only one of its type in Australia and probably the world and is a credit to the innovation of the Australian irrigation industry. For the first time, there is a commercially available package that will give real numbers on where water is being used and lost.

WaterTrack is a valuable tool that allows irrigators to determine how well their irrigation system is operating and if any further investigation or modification is required. The benefits of this technology are that once it is setup for an irrigation farm, operational changes can be investigated on paper before real changes are applied and water budgets can be checked accurately during the season.



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