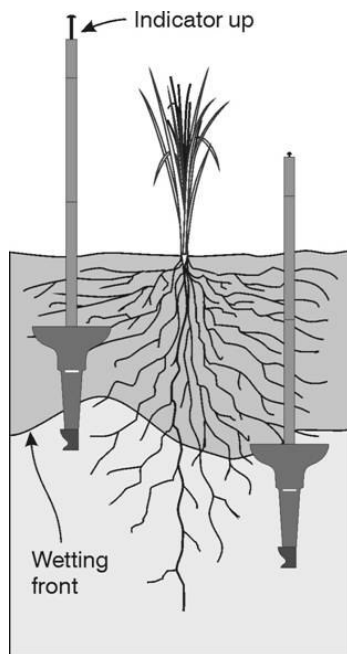


# The FullStop Wetting Front Detector

Scientists and extension workers make irrigation scheduling sound easy. The soil holds water like a bucket. An irrigator should not add too much water and overfill the bucket – that would be a waste. The irrigator must also not let the bucket get too empty – that would stress the crop.

There are excellent tools on the market for monitoring the soil water status, but the FullStop Wetting Front Detector might be the simplest of them all. The FullStop is comprised of a specially shaped funnel, a filter and a float mechanism. The funnel is buried in the soil within the root zone of the plants or crop. When rain falls or the soil is irrigated, water moves downwards through the root zone. The water gets focused inside the funnel and the soil at the base becomes so wet that water seeps out of it, passes through a filter and is collected in a reservoir. This water activates a float mechanism, which in turn operates an indicator flag above the soil surface. There are no wires, no electronics and no batteries.

**A FullStop Wetting Front Detector (right). The red funnel part is buried in the soil with the black tube protruding above the soil surface (below). When a wetting front reaches the detector an indicator pops up. Detectors are usually placed in pairs, about one third and two thirds down the active root zone**



If the soil is dry before irrigation the wetting front will not penetrate deeply, because the dry soil absorbs most of the water. A long irrigation would be needed to activate a detector. However, if the soil is relatively wet before irrigation, it cannot store much more water, so the wetting front penetrates deeply.

The Wetting Front Detector encourages irrigators to conceptualise what they are *trying to do* – and then helps them to see if that is what is happening. It gets farmers and extension workers talking and asking questions, and ultimately learning together, from the small scale grower to large corporate operations.

As well as informing the irrigator that the wetting front has reached a certain depth, the detector retains a sample of soil water which can be extracted via a tube using a syringe and analysed for its salt or nitrate concentration. This is done using a simple field salinity meter or colour nitrate test strip (see pictures).

For a full description of the Wetting Front Detector see [www.fullstop.com.au](http://www.fullstop.com.au)

### Further reading:

Stirzaker RJ (2003) When to turn the water off: scheduling micro-irrigation with a wetting front detector. *Irrigation Science* 22, 177-185.

Stirzaker RJ and Hutchinson PA (2005) Irrigation controlled by a Wetting Front Detector: field evaluation under sprinkler irrigation. *Australian Journal of Soil Research* 43: 935-943.

Stirzaker R, Stevens J, Annandale J, Maeko T, Steyn J, Mpandeli S, Maurobane W, Nkgapele J & Jovanovic N (2004). Building Capacity in Irrigation Management with Wetting Front Detectors. Report to the Water Research Commission No. TT 230/04.

**Each time a Wetting Front reaches the detector a small sample of water is retained. This can be removed by syringe. Routine measurement with a robust field Electrical Conductivity meter can show if fertilizer levels are too high or low, or when leaching is required to remove salt. Colour strips can used to give a quick check of nitrate levels in the soil.**

