

Capiphon™ Irrigation: Further Developments and Early Results of a New, Low Energy Sub-Surface System

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Abstract

Preliminary studies, reported at 2012 IAL Conference, showed that Capiphon™, a capillary drainage technology, can be adapted to “run in reverse” to provide an irrigation system that is potentially efficient in terms of water use, energy and labour.

Further refinement of the system has been undertaken in a Coal River Valley, Tasmania, vineyard. The system is now developed to the point where it can be installed at relatively modest cost, to provide a low maintenance system. An improved but simple low-pressure header tank was developed as part of the system. Once calibrated the system can be tuned to supply an equivalent volume of water - or less if desired – to that supplied by conventional drip. An estimate of water usage over the season is provided.

In this trial, sections of drip irrigation were disconnected on four adjacent rows, and Capiphon™ irrigation installed in the inter-row space. Three treatments – 6 metres each of Nil, Capiphon and Drip – were replicated. The Treatment effect is highly statistically significant, showing no evidence of a difference in fruit weight between the Capiphon and Drip treatments, but a sizable reduction of 1.73 kg (95% Confidence interval 0.80 - 2.66) between the Nil and Capiphon treatments.

Soil moisture measurements taken at the surface, 125 mm, 250, and 350 mm depth confirm that Capiphon irrigation is delivering water to the root zone while the surface is relatively drier than that under drip irrigation. Paradoxically, the cover crop of clover and various grass species is green and healthy by comparison. As expected, surface soil moisture is lower and cover crop growth poorer under Nil irrigation.