

## G.Casotti & Co – Karragullen (Perth Hills)

Crop: Apple -Cripps Pink (Pink Lady) MM101 rootstock, planted 1994

Irrigation System: Microsprinklers

Irrigation efficiency is not just about knowing how much water to apply and when to apply it (scheduling efficiency) it also encompasses how effectively the water is delivered to the crop (application efficiency).

This was the main reason for conducting an investigation into the microsprinkler system at the Waterwise on the Farm Demonstration site, managed by G.Casotti & Co in Karragullen. John Vetta, Orchard manager said the system had been there for many years and the sprinklers were delivering approx 78-84L/hour at 140kPa from field tests.

A catch can uniformity test was performed on the existing sprinklers and the results were not favorable. Distribution Uniformity  $LQ$  was 54% and a Scheduling Coefficient (SC) of 1.9. The existing sprinklers were spaced at 5m along the laterals and 4.5m between the laterals but the sprinklers had a radius of only 3.7m. There were significant areas of the orchard that were not receiving the 3.2mm/hr average application rate.

John Vetta and David Gibb (Waterwise on the Farm), started to investigate how to increase the uniformity, apply water more evenly in the orchard but keep the same application rate of 3mm/hour. The application rate needed to remain low due to the light clay soil and slow infiltration rate. After looking at several sprinkler models, the Nelson R5 sprinkler was chosen. The R5 had the largest spray radius of all the sprinklers and a constant flow of 68L/hour.

Nelson Australia staff Andrew Newman and Andrew Short assisted with choosing the right sprinkler by looking at the performance of the R5 (yellow flow control nozzle, blue 9° plate) on the Nelson Overlap 2.0 software package. On a 4.5m x 4.5m triangular spacing, the Overlap program produced a DU of 79% and a SC of 1.2. These results were very promising and needed to be replicated in the orchard.

Next, two laterals were converted to the R5 rotators on a 4.5m x 4.5m spacing and the catch cup results revealed a DU of 79% and a SC of 1.3, which was great and virtually identical to the Overlap results. The R5's produced a Mean Application Rate (MAR) of 3.1mm/hour, so the irrigation schedule did not have to change. From several sprinklers, an average flow of 68L/hour was recorded which ensured that each sprinkler was delivering equal amounts of irrigation water, which was important for future fertigation programs.

“The next stage will be to change the whole Pink Lady block over to R5 rotators”. “Based on actual flow of 68L/hour from the R5's, the bonus is a water saving of 1311L/hour across the 1.11ha”.

Graphs below: Water application patterns from old sprinklers and R5 Rotators. Note: lots of colors = low DU and uneven water distribution.

By David Gibb

