



Water and energy efficiency improved with correct impeller sizing

As a key component of Growcom’s Rural Water Use Efficiency Irrigation Futures (RWUE-IF) program for horticulture, Growcom Land and Water Field Officer, Kathleen Heuvel conducted a Hort360 irrigation module risk assessment with a citrus grower in the Biloela region.

Evaluation of the Hort360 report identified opportunities to improve irrigation uniformity and pump efficiency.

Initial findings indicated:

- elevation from pump to irrigation block resulted in notable pressure head loss with 295 kPa measured at the pump and 183 kPa at the filters
- the pump was operating at 8.44 kWh/ML/m well above the industry target of 5 kWh/ML/m
- an incorrect impeller diameter (159 mm) was reducing head capacity
- sprinkler were operating at 20 per cent below the target operating standard of 95 per cent
- pressure measured in several laterals was 110 kPa - 40 kPa below the recommended level
- sprinkler flow measured at 54 l/h - 16 l/h below designed flow rate requirement.

Inefficiencies such as these will result in:

- a failure to meet crop water requirement

- increased pump operation costs
- poor uniformity
- reduced capacity to manage the farming system
- poor return on investment
- reduce crop yield and quality.

On this advice the citrus grower fitted a 182 mm impeller. RWUE-IF conducted a follow-up pump assessment. The follow-up assessment has shown significant improvements to both water and energy efficiency.

“The larger impeller diameter allowed the pump to meet both target pressure and flow rate while operating between 60 - 70 per cent efficiency,” Ms Heuvel said.

Following installation of the larger impeller, the pump operating cost had reduced to 6.6 kWh/ML/m, close to the industry target. The pump now delivered over 6 L/s and the pressure in the field is 150 kPa, allowing the sprinklers to perform as designed across the irrigation block.

“Improvements to the pump as a result of the original assessment, have made pumping more efficient, increased uniformity and application rates, and taken pressure off the irrigations schedule,” she said.

RWUE-IF is currently being delivered in the Burnett and will be delivered in the Lockyer in 2017. Horticultural growers are invited to take part.

	ASSESSMENT ONE	ASSESSMENT TWO
Impeller diameter	159 mm	182 mm
Pump efficiency (target of 5 kWh/ML/m)	8.44 kWh/ML/m	6.6 kWh/ML/m
Flow rate	4 L/s	6.3 L/s
Sprinklers within designed operating pressure range	No	Yes
Irrigation uniformity	75%	95%



The installation of a larger impeller resulted in an increased flow rate allowing the pump to meet both target pressure and flow rate while operation at 60 - 70 per cent efficiency.

FOR FURTHER INFORMATION OR TO BOOK A PROPERTY VISIT, PLEASE CONTACT:

Kathleen Heuvel
Land & Water Field Officer
0427 138 118
kheuvel@growcom.com.au

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