

Hydroponic Lettuce Farm goes Energy Efficient

Energy Efficiency Audit reduces pump running costs by 50%.

Graham and Fiona Grant are the owner/managers of Wardell Hydroponic Lettuce farm near Ballina, NSW north coast. Graham, an ex-South African and his wife Fiona have both seen the world, working in post conflict zones such as the Balkans, but have now settled down to a quiet lifestyle to run a hydroponics lettuce farm, tucked away amongst the sugar cane fields in the Northern Rivers, NSW.

Graham and Fiona purchased an existing farm 12 months ago, and although they inherited a good workforce from the previous owner, they also inherited the high electricity bills that went with its operations.

The lettuce farm consists of 10 sheds, each 120m long by 12m wide and produce lettuce for the Brisbane domestic market. It operates on the NFT (Nutrient Film Technique) system, whereby lettuce plants are grown in troughs, supported by a plastic membrane and watered with a continuous trickle of nutrient solution across their root zone. Water is recirculated through a “closed circuit”. Each shed has its own pump which operates 6 minutes on, 6 minutes off, 24/7. Overall, the farm costs about \$43,000 per annum in electricity, but the pumps for the hydroponics sheds alone consume around \$28,000 of electricity per annum. Most of the rest of the cost is cool room use.

“DPI did a whole-of-farm Energy Audit soon after I bought the farm”, Graham said. “They confirmed what I suspected and suggested that I seek the services of a specialist pumping energy efficiency consultant to specifically examine farm pump energy usage with the view to optimising energy consumption.

“I contracted Rob Welke from Tallemenco to do an audit, and he came to site for a day. He discovered that, out of 17 pumps, with 4 different duties, I basically had one type of pump (a 2.2kW with poly wet end) to do all those duties. Given that this pump was a swimming pool type pump with poor pumping efficiency in the first place, when combined with the fact that they were ill matched to their operating duty, operating efficiencies were down as low as 16% in one instance!”

Graham continued: “Rob recommended hydraulic optimisation in 2 sheds, and recommended four types of replacement pumps, (all 1.1kW with 316L SS wet ends, but different duties) which were an economical replacement for 14 of the 17 pumps. Their replacement should yield a 50% reduction in



Inside one of Graham and Fiona's 10 hydroponics lettuce sheds. Photo: Graham Grant

electricity consumption, or \$14,000 p.a. worth, resulting in a return on investment in 2.2 years. The good part is that I could take Tallemenco's report to the bank to support a capital loan to cover the pump replacement costs."

Graham is also working on reducing the total pumping time to further reduce electricity consumption by tailoring the pump duties to the water/nutrient requirements of the plants. During these periods, we can optimise total hours pumped and hope to save an additional 10% electricity consumption.

"Employing an energy efficiency specialist has been a very worthwhile experience for our farm. With the steeply rising energy costs we have at the moment, up to 18% per year, and now the carbon tax on top of that, I recommend anyone with high farm electricity costs to employ an energy efficiency specialist such as Tallemenco to do an energy efficiency audit, as the returns can be significant," Graham concluded.

Tallemenco's web site is www.talle.biz and Rob at can be contacted at rob@talle.biz or phone 0414 492 256.