



**RURAL
WATER USE
EFFICIENCY
IRRIGATION
FUTURES**

Improving irrigation management
for a profitable and sustainable future

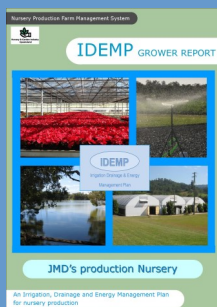


Queensland Government

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Irrigation, Drainage & Energy Management Plans (IDEMP) describe the infrastructure and management practices in operation at a production nursery and outline plans, designs, suggestions and opportunities for on-farm system and equipment improvements and upgrades.

IDEMPs support growers in nursery production to address both economic and environmental issues relating to water access, recycling, storage and use to ensure the business remains profitable and sustainable into the future.



IDEMP

Irrigation Drainage & Energy
Management Plan



Nursery & Garden Industry
Queensland

The Pipeline

An electronic update on Nursery Production RWUE-IF project activities

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Nursery Production Rural Water Use Efficiency—Irrigation Futures (NGIQ RWUE-IF)

IN THIS PIPELINE

Making Site Improvements -A Case Study

Knowing Your Irrigation and Drainage System

DATE CLAIMERS

Big Leaf Wholesale
Nursery Field Day – March 8.

NQ Growing media
workshop - April 6.

VIDEO

Managing Water Storage Water
Quality -
<https://youtu.be/X8tSWdmHVug>

Managing Water Storage Water
Quality Case Study -
<https://youtu.be/xzuDNpFR7P8>

Making Site Improvements -A Case Study

Big Leaf Wholesale Nurseries is the location for the next Nursery Production Farm Management Systems Field Day event taking place on March 8. The nursery is located at North Arm in the hinterland of the Sunshine Coast, and has been developed to meet nursery industry Best Management Practice (BMP) standards.

Development of the new 4.05 hectare site is just three years into a five year development plan, with the current 10,000m² of pot production area to be expanded to 15,000m² when completed. Compared to their previous site, a sixty percent improvement in water use efficiency has been achieved in establishing the new site to industry Best Management Practice.

Water is critical to nursery production, with approximately 73,000 litres of water currently required for nursery irrigation each day during summer. The irrigation water is supplied from a 9 ML dam on a neighbouring site, and to increase water security on-site bore water is being accessed. However, due the marginal levels of bicarbonate in the bore water, blending with the dam water will be necessary to make it suitable for use in the nursery.

To manage the irrigation application requirements, a Lowara ISSV Variable

Frequency Drive (VFD) pump was installed. The VFD pump has the capacity to adjust the pump speed and therefore its output, to match the requirement of each individual irrigation zone that vary in size and elevation, ensuring efficient irrigation application.



A new 63 mm irrigation main line was installed to distribute water across the nursery keeping hydraulic or friction losses to a minimum. Using the existing mainline pipework would have required greater pumping capacity, delivered more stress on the pump, required greater maintenance and increased energy costs.

Irrigation water is disinfested using sodium hypochlorite (pool chlorine) injected into the water in the 90mm transfer supply pipe from the dam storage. An Azud disc filter removes impurities from the water before disinfestation to reduce the chlorine demand. The water is then transferred to four 30,000 litre storage tanks to achieve the required 3 ppm chlorine residual and 30 minute contact time. Three Toro F-600 media filters are used to remove remaining impurities prior to using the water for irrigation.

Irrigation application is managed using a Hunter I-Core 48 station controller. Significant water savings have been achieved in moving away from

IDEMP Video and Technical Information

For an introduction to IDEMPs go to the following link to see a video explaining more—
<http://youtu.be/1YQXpO6lBYQ> . For technical information visit the NGIQ Technical Information Library at <https://www.ngiq.asn.au/resources/technical-information/>

manually scheduled irrigation and also incorporating a rain sensor into the Hunter controller.

Overhead sprinkler irrigation is utilised throughout the nursery using both upright and inverted systems. Riser heights on the upright sprinklers are maintained as low as possible to reduce wind effects. Sprinklers are spaced on 4 x 4, 5 x 5 or 6 x 6 metre grids to provide excellent coverage and reduce energy use. Larger grid spacing would require less fittings and sprinklers, however more energy would be used to drive the droplets the extra distance. Increased grid spacing would also require larger droplets to withstand wind effects, causing compaction of the growing media in the container, along with water and growing media splash on impact that often damages young plant material.

The sprinklers used across the various production systems include Antelco Rotormax, Nelson S10, Nelson R10 turbo, and inverted Naandan green swivel.

Constructing larger production areas or irrigation zones, along with consolidating like water use plants together, has improved water use efficiency through improved irrigation scheduling. Continued nursery growth and expansion may facilitate larger production runs providing further opportunities to improve irrigation scheduling.

Installing the sprinkler systems to industry BMP along with a variable speed drive pumping system, increasing irrigation main line diameter, increasing the size of irrigation zones, consolidating like water use plants together, purchasing an irrigation controller, and the use of a rain sensor have all contributed to substantial water and energy savings for the business.

Knowing Your Irrigation and Drainage System

How much do you know about your irrigation and drainage? Knowledge of your irrigation and drainage systems helps you to make informed decisions on required system changes. The following short questionnaire will help to identify those areas you may need to look at to improve your irrigation and drainage systems.

Irrigation

- Do you have a water meter on your irrigation supply?
- How much water do you currently use per annum?
- In the middle of summer, what is the highest daily water requirement?
- How much is water worth to your business in dollars/megalitre
- For each irrigation zone in the nursery do you know the sprinkler being used, the operating pressure, Mean Application Rate, Coefficient of Uniformity and Scheduling Coefficient?
- How often do you check the block pressures on the



Knowing more about your irrigation and drainage improves decision making.

- irrigation system?
- How often do you check the Mean Application Rates (MAR) of the irrigation system?
- Do you recycle your irrigation runoff?
- Do you collect the storm water runoff from your roofs and production areas separately?
- Which plants that you grow require the most water to produce?
- How much water do these plants require for a full production run?
- What plants require the least amount of water to produce?
- How much water do these plants require for a full production run?
- Do you check the quality of your drainage water and, if so, how often?
- How often do you schedule your irrigation?
- How do you change your irrigation practice under water restrictions or low water availability?

Drainage

- What components make up your drainage system? Surface earth drains, surface concrete drains, surface sealed drains other than concrete, pipe drains, slotted drainage pipes, sediment traps, interception traps, water treatment, and collection sumps/storage?
- What methods do you use to minimise downstream pollution?
- Does the current drainage system require maintenance e.g. erosion, ponding water?
- Does your drainage system meet all necessary state and local regulations?
- What are your recycling options?
- Is your drainage water storage of sufficient capacity to store the wettest month's runoff volume?

In the Pipeline for March/April 2017

- Burnett/ Wide Bay, Sunshine Coast, Brisbane, Gold Coast, Lockyer Valley and North Queensland - IDEMP development site visits.
- Big Leaf Wholesale Nurseries Field Day - March 8
- North Queensland Growing Media Workshop - April 6

