RURAL WATER USE EFFICIENCY
IRRIGATION FUTURES
Improving irrigation management for a profitable and sustainable future

Queensland Government
Supported by the Qld Government
Department of Natural Resources and Mines

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.

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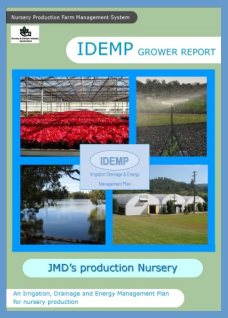

IDEMP
Irrigation Drainage & Energy
Management Plan

Nursery & Garden Industry Queensland

The Pipeline

An electronic update on Nursery Production RWUE-IF project activities

Volume 2 Issue 2 **Newsletter Date 28.4.2015** Page 1

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

IN THIS PIPELINE
Irrigation system maintenance.
Conduct an irrigation system audit.

DRIP IRRIGATION VIDEO
http://www.ngiq.asn.au/technical-information/?did=286

DATE CLAIMERS
Spring Green Expo. 16-17 June. Gold Coast Convention Centre.

Irrigation system maintenance

Working with growers across Queensland in recent weeks has highlighted the need for regular irrigation system maintenance. The consequence of these poorly maintained irrigation systems was a reduced application uniformity, with a significant increase in water use. This often went unnoticed due to a lack of water use recording, infrequent system performance testing and poor communication from field staff.

Poor irrigation application uniformity leads to longer pumping and transfer times, extra water disinfestation costs, increased energy costs, decreased production, increases in disease incidence and a greater strain on irrigation system equipment.

Results of irrigation catch can assessments outside of nursery production best management practice (BMP) target values quickly identified these poorly performing systems, allowing growers to implement appropriate maintenance activities.

Simple irrigation system maintenance procedures should be regularly scheduled to ensure the irrigation system operates to nursery industry BMP target values. Checking the operating pressure of each irrigation zone is the first step. Installing a Schrader valve in each irrigation area minimises costs and provides easy access for testing system pressure. Records of all pressure testing should be maintained to compare previous results and identify changes or developing trends.


Water Meter

Regular recording of total water use can alert growers to water use volumes that are significantly outside of normal recorded values, indicating system faults such as broken pipes, blocked pipes, leaks, faulty solenoids, filtration problems, and irrigation controller issues.

Visual inspections of each irrigation zone can identify emitters or sprinklers not operating correctly. Production field staff should be trained to communicate field issues such as poorly performing emitters or dry areas, to management as soon as possible.

Regular monitoring and maintenance of filtration is essential to the efficient operation of an irrigation system. Automated filter systems must be regularly monitored and often require additional backwashing during periods of heavy system demand. Pressure test points before and after the filter can quickly identify pressure loss across the filter and any requirement for further cleaning.

Conducting an irrigation catch can assessment on each irrigation block or zone quickly identifies poorly performing systems. Under the Nursery Production Farm Management System BMP program EcoHort, growers are required to conduct catch can assessments every six months to ensure the continued efficient operation of the irrigation system to the nursery production BMP target values.

IDEMP Video and Technical Information
For an introduction to IDEMPs go to the following link to see a video explaining more—http://www.ngiq.asn.au/technical-information/?did=252. For technical information visit the NGIQ Technical Information Library at www.ngiq.asn.au/technical-information or click on the centre icon on the home page.

Conducting an Irrigation System Audit

Schrader Valve

A survey of production nurseries that participated in WaterWork workshops found that information on average water use, water costs, pumping costs, maintenance costs, and hand watering labour costs was not known. A similar lack of data has also been found during the course of the RWUE-IF project. The benefit of a system audit for production nurseries is that it identifies maintenance items that will reduce system downtime and will help to improve productivity and profitability. Conducting a system analysis demonstrates to regulatory authorities that a responsible approach is being taken to water management, and impacts to the environment are being minimised. As an industry, it is imperative that information gained from irrigation system audits is readily available, so that production nurseries have continued access to water.

A full evaluation of the current irrigation system and irrigation management may require a qualified irrigation specialist, but much of the data on system performance can be collected by staff e.g. information on sprinkler performance.

When conducting an irrigation system audit, water supply is the first area to be investigated. Information on total availability, quality and quantity limitations, costs and backup supplies needs to be recorded. If bores are used as a water source, information on the sustainable long term pumping rate, seasonal variability in standing water level, depth of aquifers, casing size and screens used is required to determine the available water and pumping efficiency. The amount of drainage water and available collection and recycling options, along with the limiting factors for recycling or reusing water demonstrates the feasibility of water recycling. Water quality needs to be determined by a full laboratory analysis and, in addition to the full nutrient analysis, tests such as turbidity need to be done if ultra-violet disinfestation is being used. Full nutrient tests will determine if there is a clogging hazard, and what disinfestation limitations are imposed by water quality.

Information is then gathered on irrigation scheduling covering areas such as how scheduling is managed to minimise wind effects, reduce excessively wet foliage, minimise interference with staff working schedules, and to take advantage of off-peak power or water periods. A benefit of reviewing this information is that it can help to reduce excessive water use and nutrient leaching, which will improve uneven and/or slow plant growth, poor internode spacing and plant shape and reduce leaf drop. This also provides information on how to reduce excessive drainage and minimise the impact on elevating and/or contaminating water tables. A record should be made of the current irrigation schedule for each block, the process used to determine irrigation run times, and any seasonal variations in scheduling.

Details of pumps, particularly pump curves, can be obtained from an irrigation specialist and the performance of the pump compared to the duties required. Recording shut off pressures and comparing these to pump curves indicates the amount of impellor wear and, from this, in conjunction with measuring suction losses, the efficiency of the pumping system can be calculated. An assessment of system hydraulics can then be made to enable comments to be made on the adequacy of pumps, pipes and valves, and changes that need to be made to optimise performance. Finally, a maintenance schedule for the pumping units can be developed.

Other areas that are included in a system audit are the type and size of filter units and suitability for the application, along with records of back-flushing frequency and maintenance done on the unit. Catch can tests can be done to determine Mean Application Rate (MAR), Coefficient of Uniformity (CU), and Scheduling Coefficient (SC) and a record of operating pressures, types of sprinklers and spacing made. An outline of a system maintenance schedule and how the system is monitored can then be developed e.g. pressure and output monitoring

Finally, the drainage system is described, detailing the types of drains used, and how well they cope with water in heavy rainfall, and demonstrate how drainage is managed to minimise downstream pollution. Information on how well the drainage system matches the slope, soils and rainfall intensity and if the system meets all regulations should also be recorded. In this assessment, it should be shown how the storage of water optimises water retention and minimises pollution in surface and groundwater systems, and that losses through seepage are minimised.

Auditing highlights the limitations and opportunities that are available for optimising water use efficiency through management and technological improvements. At the end of the process a prioritised action plan can be drawn up, and this then allows improvements to be costed and planned for.

For further information on conducting an irrigation system audit refer to The Nursery Papers May 2006 Issue no. 4.

In the Pipeline for May / June 2015

- Burnett/ Wide Bay, Sunshine Coast, Brisbane, and Lockyer Valley - IDEMP development
- Contacting and sending surveys to businesses who have registered interest in having an IDEMP completed
- Brisbane Trade Day - 27 May
- Spring Green Expo. 16-17 June. Gold Coast Convention Centre