



RURAL
WATER USE
EFFICIENCY
IRRIGATION
FUTURES

Improving irrigation management
for a profitable and sustainable future

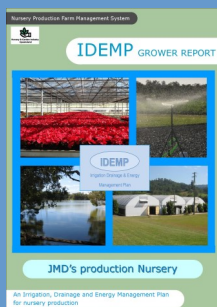


Queensland Government

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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

Improving Water Security.
Constructing BMP Growing Beds.

VIDEO

Constructing BMP Growing Beds — <http://www.ngiq.asn.au/technical-information/?did=340>

DATE CLAIMERS

North Queensland Field Day - Anza Nursery - April.

Improving Water Security

Recent visits by project officers Steve Hart and Lex McMullin to production nurseries participating in the RWUE-IF initiative have focused on calculating water balance scenarios for those participating businesses as part of the development of the nursery's Irrigation Drainage and Energy Management Plan, IDEMP. This exercise has highlighted to growers the water use efficiency benefits of catching and recycling wastewater from irrigation and rainfall. Under the RWUE-IF initiative and the development of an IDEMP for each participating production nursery, water balance and water security planning are priority issues.

Whether maintaining production or planning for expansion, water for irrigation is often the limiting factor, and growers need to identify the irrigation resources available to the nursery, not just in an average year but also through the drier years. Securing irrigation water reserves to support existing or expanding nursery production can be expensive. The purchase of additional property with existing water resources, constructing new dams, sinking of bores and fully relocating the nursery are some of the options being investigated by nurseries across Queensland.

Efficiently catching and recycling nursery wastewater from irrigation and rain events is a sound investment, particularly when irrigating from overhead sprinklers. Growing beds constructed to nursery Best Management

Practice, BMP, combined with efficient sub-surface and surface drainage systems can direct significant volumes of water to storage and may reduce the requirement for alternate water supplies.

The latest technical video produced for the nursery production RWUE-IF initiative is titled 'BMP Growing Bed Construction' and can be accessed by following this web link: <http://www.ngiq.asn.au/technical-information/?did=340>. Technical articles on water security and sustainability in nursery production are available on the NGIQ website (<http://www.ngiq.asn.au/>) and the 'Nursery Production Technical Information Library' page (<http://www.ngiq.asn.au/technical-information/>).



Laying gravel on growing beds

Constructing BMP Growing Beds

Constructing production growing benches and beds to the standard recognised and encouraged under NIASA, the nursery industry best management practice program, provides a range of significant benefits not always easily identified.

Construction of growing beds within a production area to NIASA accreditation standards may be slightly more expensive, but is soon recognised as a sound investment when the following critical factors are all considered:

- increased longevity of the cropping life of the growing bed

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.

- reduced maintenance of the cropping area
- trouble free all weather access
- improved production efficiency
- reduced pest and disease pressure
- healthier work environment
- reduced chemical usage
- lower labour input requirements
- increased environmental benefits
- improved efficiency of collection and drainage of irrigation waste water and excess rainfall to water storages
- a measure of on-farm biosecurity protection against current and future pest and disease threats.

Construction of growing beds within each production area will be dependent on the site characteristics such as the general slope of the production area, the soil type and the recorded history of rainfall volume, intensity and frequency. Production areas should be designed and constructed to provide complete separation from the ground (a potential pest and disease source), divert local waste water and overland flow away from production areas, quickly drain away irrigation waste water, and efficiently remove excess rain water away from production areas to water storage facilities. A well designed growing bed will prevent the water rising to the level of the container drainage holes, reducing the risk of contaminating the crop from potential pathogens.

Growing beds and the supporting infrastructure should be designed, constructed and managed to meet the demanding requirements of the production environment. The slope and nature of the ground should be identified, and the growing areas designed to provide suitable all-weather access to the production area, provide a safe work environment and reduce any potential environmental issues caused by excess water from irrigation and rain events. The exposure of the site and growing beds to wind should be determined and buffers or wind breaks planned to manage all wind effects on the proposed production area.

The production area and growing beds should be constructed with the current cropping requirements in mind. However, the production area design should be made as versatile as possible, allowing for future changes to production, including crop type, container size, crop density, production runs, irrigation method, growing media, mechanisation and access requirements.

Ground preparation for the growing bed construction should ensure a fall of 1:70 is maintained to ensure that drainage water is carried away quickly and efficiently, without causing damage to the growing surface. Once the site has been graded, the trenches for subsurface drainage are dug through the area. Trenches for the location of subsurface drainage pipes should be excavated to a fall of 1:100 to allow sufficient flow within the pipes to efficiently remove the drainage water and minimise sediment build-up. Subsurface drains are generally installed in a herringbone pattern,

with trenches spaced approximately 5m apart over the growing area. However, the spacing of the subsurface drains is dependent on the anticipated intensity of rainfall. If insufficient drainage is installed, the system will not be able to dispose of the water quickly enough, and water will move through the gravel as the drainage pipes overflow, leading to erosion of the gravel surface.

The whole area, including the drainage trenches, is then covered with black builder's plastic of a minimum thickness of 200 microns. This creates a barrier between the nursery bed and the underlying soil so drainage water can be collected and drained away efficiently. This also prevents drainage water causing boggy areas and contaminating groundwater supplies. The plastic also helps minimise the need to top up the gravel by preventing the underlying soil moving into the gravel bed.

To allow water to be carried away more rapidly, slotted Ag-pipe or PVC pipe is laid into the trenches on top of the plastic and the trenches backfilled with 20 mm blue metal. Slotted pipe with a sock can be used to minimise the movement of fines into the drainage system and reduce blockages.

After the installation of the sub-surface drainage, the whole area is covered with a 100mm depth of 20 mm blue metal or similar. The material used for this must be free draining and contain a minimum of fine particles to minimise blocking of the subsurface drainage. All efforts must be made to prevent puncturing the plastic, which will allow water through to the underlying soil, creating boggy areas. Machinery should not be driven over the plastic once it is laid, and if machinery is used to move the gravel, they must only be driven over the areas already covered by gravel. Another option may be to use a tipper truck used for laying blue metal on roads to lay the bed.

Weed matting can be installed on top of the growing bed to prevent debris and spilt growing media from contaminating the blue metal, and to provide a more stable platform for smaller sized containers. A weed mat surface also makes the area easier to clean between crops, but will result in dirty pots from media splash onto the containers.

The installation of the irrigation is ideally done once the gravel has been laid. Having no irrigation to work around makes it easier to spread the gravel, but it may be more convenient to install the irrigation first if the preference is for pipes to be buried under the gravel. If upright sprinklers are used, a stake will be necessary to support them on and this may mean that the membrane will be punctured.

The amount of water draining into the ground underneath the plastic through these holes can be minimised by mounding the soil under the plastic directly around the stake, and sealing the hole with tape. It should be noted that laying irrigation laterals under the plastic can lead to maintenance problems if the system needs to be accessed at a later date and would not be recommended.

In the Pipeline for January/ February 2016

- Burnett/ Wide Bay, Sunshine Coast, Brisbane, Gold Coast and Lockyer Valley - IDEMP development
- Growing benches video development
- Planning 2016 RWUE-IF activities

