



Nursery & Garden Industry  
Queensland

# Water balance

*Water quality and quantity is essential for nursery production to facilitate the growing of healthy crops in a reasonable time frame.*

Throughout Queensland and indeed throughout Australia, water availability has been in question as a result of recent drought periods, water quality in many waterways and, in some localities, over allocation of the resource. It is anticipated that there will continue to be less water available for agriculture and in particular nursery production due to:

- Increasing population pressure and competition for the water resource in peri-urban areas, where the bulk of nursery production is located.
- Changing weather patterns. Across many areas of Queensland the temperature and rainfall cycle appears to have altered in recent years. The occurrence of more intense but less frequent rain events has led to greatly reduced ground or soil infiltration and increased runoff.
- Local authorities continuing to develop 'Catchment Management Plans' to address water quality and ecosystem health for each waterway in their locality. These plans are designed to manage both water use and the wastewater quality returning to the system.
- Reviews of water access, allocations and entitlements in many areas across Queensland.

To maintain maximum production output it essential the business has sufficient water security to for the entire growing season. Some simple

calculations can shed some light on the crop requirements for a season, and the how this aligns with water reserves or supply.

## Crop water use

Water meters installed in the irrigation system can quickly and simply provide water use data for a growing season or production year. This information can often include both the crop irrigation along with other nursery water use such as washing and cleaning of beds, benches and containers. Where a water meter is not installed it is possible to calculate water use by measuring the volume of water emitted by one sprinkler in an irrigation zone, multiplying by the number of sprinklers in that zone, and then simply multiplying by the duration the irrigation zone is operated in a year. The results from each irrigation zone can be totaled, and then added to the calculated water volume used in general hosing and cleaning in a similar time frame, providing a measure of the total water used in production in a growing season or production year.

## Available water

Water has a cost to the production nursery. Reticulated town water supply has a direct cost, underground water has to be brought to the surface and distributed around the nursery, and surface water has to be stored, pumped and disinfested. Town water supplies may be limited by restrictions on 'time of day' use, supply due to service pipe size, restriction on volumes available for general horticulture, and seasonal restrictions due to local conditions such as drought. Underground water may be limited by

the volume of water available due to climatic conditions, local pumping competition, the aquifer recharge time, or by the water quality and the need for treating or blending the water to make it suitable for use. Surface water in storages is restricted by the physical catchment and collection infrastructure, storage volume, storage water quality, weather conditions, losses due to evaporation and seepage, recycling efficiency and filtration and disinfestation capabilities.

Water available for production and irrigation can be calculated and compared against rainfall data from normal and dry years to identify any shortfalls that may occur. This is particularly important when planning for expansion phases within a business. Water security should be addressed as part of physical or production expansion planning.

#### **Water conservation**

A number of actions can be taken to improve water security in nursery production.

1. Calculate current and future water requirements to allow sensible production planning.
2. Install an efficient drainage system to ensure maximum capture of nursery wastewater.
3. Recycle nursery wastewater back onto production areas with appropriate disinfestation.
4. Improve on-farm irrigation infrastructure to improve water use efficiency:
  - improve irrigation application systems to industry BMP
  - upgrade application systems to more efficient techniques e.g. drip irrigation
  - adjust plant spacing
  - group like water use plants together in an irrigation zone
  - adjust growing media e.g. add water holding materials.

5. Improve on-farm practices to improve irrigation efficiency

- improve irrigation scheduling e.g. evapotranspiration based decision making
- consolidate plants in zones or blocks during sales periods to facilitate turning off irrigation in areas not in use.

Effective production and expansion planning is not feasible without some knowledge of current and future water requirements. Contingency planning for dry years and drought periods is not possible without an understanding of the production water use requirements. It is difficult to communicate with government or local authorities for water allocations or water access, if a history of production irrigation requirements for a business is not available. Financial institutions are more comfortable in lending money if business sustainability can be documented. Local authorities often require documentation on sustainability and catchment interaction when reviewing site approval for development or construction of structures. The information contained in an Irrigation Drainage and Energy Management Plan (IDEMP) helps to answer many of the above questions, and provides a prioritised action plan to improve overall system efficiency. More information on IDEMP's can be found by contacting NGIQ or a Farm Management Systems Officer.

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