

# Water Use and Best Management Practice Within the Nursery and Garden Industry<sup>®</sup>

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## INTRODUCTION

Fresh, useable water is one of Australia's and the world's most precious resources. As a resource, fresh water represents 2.5% of the world's water supply.

Like other horticulture industries, the nursery and garden industry requires access to appropriate and reliable water supplies. Water is crucial to nursery and plant production, and water is a resource we need to be aware of conserving.

As an industry we know we need to be "waterwise." More importantly it is essential we implement and achieve high water-use efficiency without sacrificing plant quality and productivity.

In order to improve water access, given competition amongst users and the influence of dry climatic conditions, it is important for the nursery industry to be promoted as a responsible and efficient water user to help achieve:

- A secure "water future" for our businesses;
- Recognition of established Industry Best Practice; and
- Recognition of the industry's own initiatives in water conservation.

The nursery water audit conducted by RMCG in 2006 helps to clarify the efficiency of water use and associated water management practices within the industry by providing information to demonstrate its water efficiency.

## INDUSTRY WATER AUDIT

An extensive amount of information and data has been collected and analysed. This has been obtained through a number of different avenues, including:

**Water Authority Data.** A number of water authorities or companies were contacted to obtain additional and/or supporting information on nursery water use.

**National Survey of Businesses.** A total of 245 production nurseries and 82 retail nurseries participated in the study. The survey targeted a national audience. A total of 76 surveys or 24% of the sample were completed online; the majority of responses were returned by mail.

**Case Study Information.** While useful quantitative information was provided via the national survey, it is also important to identify some of the more qualitative messages behind the data. The case studies essentially provide an on-site audit and in-depth analysis of the issues behind management actions undertaken by nursery businesses.

## KEY FINDINGS

The results from the national survey provide a real picture of how much, and how, our industry uses water. Among key findings it shows:

- Median annual water use for production nurseries is around 7.7 ML·ha<sup>-1</sup>. For retail nurseries the figure is higher at 13.1 ML·ha<sup>-1</sup>.
- The cost of water represents a low percentage of business turnover for most nurseries. The median cost of \$382/ML for production nurseries and \$995/ML for retail nurseries. Water charges in the agricultural sector range from \$15/ML to \$150/ML.
- Underwatering can be costly relative to overwatering — for retail nurseries production losses may be 30 times greater than the relative cost of water and six times greater than water costs for production nurseries.
- More than half of production nurseries and 17% of retail nurseries already recycle water, with a third of survey participants planning to implement or upgrade recycling systems.
- Most nurseries view water management as a medium to high priority. A total of 94% of production and 90% of retail nurseries have already used a range of initiatives to improve water use efficiency.

The audit provides information to demonstrate water efficient practices have been widely adopted across the nursery industry; however there is a need for more progress in this area.

The study provides a benchmark for businesses to measure their water use and to encourage them to implement new or improved water management measures.

Key recommendations for the nursery and garden industry to implement include:

- Promoting benefits of a documented water management plan.
- Investment in waterwork and developing best management practice guidelines.
- Facilitating uptake of onsite recycling by both sectors of the industry.
- Encourage ongoing monitoring and recording of water use — ML/yr) is known by all businesses.

## **EFFICIENT IRRIGATION**

The NGIA water use survey highlights the variation in the types of businesses and types of irrigation systems and technology implemented by these businesses.

In all cases of irrigation, efficient irrigation practices are achieved when water is applied evenly to meet plant water requirements. This is irrespective of the type of irrigation system in place, however predominantly applicable to overhead irrigation systems.

The irrigation system needs to be designed to meet:

- Coefficient of uniformity > 85% (how uniform the water is applied across an area).
- Mean application rate < 25 mm/h (how fast it is applied to be accepted by the growing medium).
- Scheduling coefficient < 1.5 (the variation in water supply across an area and how much longer the irrigation system needs to be run to wet the driest pot).
- Inclusion of an irrigation controller, which offers flexibility in the delivery and application.

There are numerous types of irrigation systems in operation, ranging from fixed overhead, boom sprinklers, capillary mats, ebb and flow, flood and drain, drippers, and hand-held hoses. All systems should be assessed according to the performance criteria listed above.

To optimise water-use efficiency, the implementation of a recycling system is recommended. This allows water that is not directly applied to the pots (overhead systems) and that could be lost to be recovered, treated, and then reused on the crops areas. Recycling has the potential to optimise total plant water use but needs to be well designed and implemented to avoid waste water discharge and excessive costs associated with water treatments to allow disinfection.

Sediment traps and filtration of waste water are critical to reduce the disinfection load. Pending the water quality, a disinfection treatment to control pathogens is required to operate safely according with the principles of the Nursery Industry Accreditation Scheme of Australia.

In 2006 the nursery and garden industry revised the successful Waterwork Training Course. It now includes four modules with increased details on water quality, irrigation systems, drainage and recycling, and fertigation. The course is available for delivery by the state and territory nursery and garden industry associations. For information on the course go to <[http://www.ngia.com.au/training/current\\_projects.asp](http://www.ngia.com.au/training/current_projects.asp)> and follow the links to the waterwork course.