

Disinfestation of irrigation water

Nursery production is dependent on the availability of good quality, disease free irrigation water to support the industry's intensive crop production. Water for irrigation will continue to become harder to access as well as more expensive in the future.

To maintain access to water, production nurseries and the nursery industry in general must be recognised as a responsible and efficient water consumer that demonstrates compliance with current laws and legislation, meets catchment and regional strategies, and must be identified as a responsible member of the community.

Utilising production wastewater in nurseries is an efficient and cost effective irrigation water source when managed properly, but will need some form of treatment before the water can be reliably used for irrigation, as many disease causing organisms are easily transported in this recycled irrigation water.

Water disinfestation is a treatment to reduce the risk of introducing disease or disease causing organisms to the crop by way of the irrigation water.



There are a number of disinfestation techniques that are recognised under industry best practice programs for use in nursery production, however their effectiveness is affected by different aspects of the wastewater quality. The pressure on the various disinfestation systems can be reduced by pre-treating the water or water storages before the final disinfestation treatment, greatly reducing the overall treatment costs and ensuring treatment success.

Disinfestation treatment of wastewater can be assisted through:

- Testing the quality and quantity of the wastewater to be treated prior to selection of a disinfestation treatment method,
 - Over an extended time period to identify any fluctuations
 - Changes due to seasonal variations eg. summer vs winter
 - Changes as a result of production pressures eg. large potting/planting events
- Managing wastewater drainage and collection systems,
 - Install sediment & trash traps to remove sand, gravel & rubbish from wastewater
 - Grass or seal drains to reduce clay colloids entering the wastewater storage
 - Install wetland areas to reduce nutrient loading of the wastewater
- Managing the wastewater storage facility,
 - Reduce aquatic weeds and algal growth
 - Locate pump suction to avoid surface and bottom water storage levels
 - Aerate and circulate the storage to improve water quality
 - Add coagulants to 'floc' clay particles
- Managing iron, manganese and sulphur
 - Treat dissolved iron with aeration, chlorination or greensand filtration
 - Treat manganese with chlorination or greensand filtration
 - Treat sulphur/hydrogen sulfide with aeration and circulation
- Pre-treating the wastewater to suit the disinfestation system selected.
 - Filter the water to the level required by the treatment system
 - Adjust the pH to meet treatment

Clean water for irrigation is essential for healthy vigorous plant growth and reticulated town water, water from deep bores and clean roof catchments are considered suitable for nursery irrigation without disinfection treatment, provided this water is stored carefully and not contaminated prior to use.

Disinfection of irrigation water aims to reduce the risk of bringing disease into the nursery via the irrigation water. Water requiring disinfection treatments can be managed using chemical (chlorination, bromination, chlorine dioxide or ozone) and non-chemical methods (heat, ultra-filtration, UV radiation or slow sand filtration).

In selecting a disinfection system a number of questions should be addressed prior to selection of a treatment system:

- What are the total costs in setting up the disinfection treatment system?
- How much will it cost to operate the treatment over time?
- What supporting infrastructure is also required (filtration, electricity, tanks, pumps)?
- Where in the system should the disinfection treatment be located?
- What is the current water volume requiring disinfection treatment?
- What is the capacity of the treatment system & its ability to adapt to future requirements?
- Can the system be automated and what levels of automation are available?
- Is it possible to easily monitor the treatment system operation?
- What monitoring protocols, equipment and procedures are required and at what cost?
- Are there alarm, bypass or emergency stop facilities incorporated into the system?
- What are the maintenance requirements of the treatment system?
- What is the life of the disinfection treatment system?
- Who will install and commission the system to ensure accurate operation?
- How complicated is the system to operate and troubleshoot?
- What back up or technical support is available and the cost?

The information gathered will assist each business in making an informed decision on the selection of a disinfection treatment system suitable for each specific site and provide valuable data for design engineers and irrigation professionals.

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