



Water for Profit

PACKING SHED RECYCLED WATER TREATMENT OPTIONS



The level of treatment required for water recycled from a packing shed is highly dependent on the intended use of the recycled water. Water to be used simply for irrigation of crops may require little or no treatment. Water to be re-used in washing product that is eaten uncooked will need to be treated to a potable standard.

Water quality parameters that need to be addressed

Physical

Physical parameters such as Total Suspended Solids, turbidity and colour may need to be addressed.

Contamination is not a problem for irrigation in most cases but may result in residues or stains if used for wash water.

Treatment options: Most of these problems can be treated using filtration systems. Different classes of filtration such as disk, mesh or sand filtration will work on most particles. However for some contaminants, settling, or chemical flocculation may be the best option.

Biological

Human health issues should be considered if any water that contacts the crop has biological contaminants. Human health issues include bacteria, viruses, protozoa, parasites and some algae. All of these contaminants would make produce unsafe to eat unless cooked.

Biological contamination with plant disease causing organisms should be considered before using recycled water crops in the field, so as not to spread disease.

Treatment options

Chlorine and iodine are used to disinfect water and can be supplied in different forms and delivered in a number of ways. Effective disinfection will depend on dose rates and water quality. The pH of the system is specifically important in chlorine systems.

Ultraviolet radiation is used to kill biological contaminants. Its effectiveness is dependent on water clarity and intensity of light. A chemical treatment is also used for residual effect.

Oxidation treatments use chemicals such as ozone, chlorine dioxide, hydrogen peroxide and peracetic acid as strong oxidising agents to disinfect water. They all have slightly different properties, and some peracetic acid formulations are accepted for use by some organic certifiers.

Chemical

There are a variety of chemical water quality issues that have very different effects, considerations for use, and possible treatments. However, the primary physical parameters to consider are the pH, acidity and alkalinity, salinity and overall nutrient content.

Extreme levels of pH or high salts would make the water unsuitable for irrigation. Post-harvest effects of salt, extreme pH, and alkalinity must also be considered.

Treatment options

The levels of pH, acidity, alkalinity, salinity and overall nutrient content are difficult to change in large amounts of water. The main treatment option for large amounts of water is shandying with other sources. For smaller volumes of water, pH levels can be changed using chemical treatments.

Water treatment systems

Batch

These systems include dunking vats and closed loop recirculating systems used for short periods. These systems use a defined amount of water and a prescribed amount of sanitiser or treatment is required for that water.

Water in these systems will need to be discarded regularly depending on the level of treatment, and amount of produce being washed. These systems require treatments with residual effect (such as chlorine) as produce washed earlier in the cycle would otherwise contaminate water without some form of treatment present.



Constant dose

This type of system works by adding a treatment to a water flow or tank at a constant dose, regardless of the condition of water. This could be used in a flow through system or a recirculating system.

This type of system should be built to take effect with the worst possible quality of water, but will overcompensate where water quality is better.

These systems are simple and effective. However, over time they may be wasteful of water treatment products. There may also be concerns if over-dosing is going to affect produce quality or if high levels have implications for the waste water stream.

Monitoring/loop systems

For recirculating systems where water is treated and reused in produce washing, monitoring systems with more precise control of water treatment are used. These systems sense the condition of the water in some part of the process and then add water treatment products to correct levels as needed.

These systems offer more precise control of treatment levels, and minimise wastage of treatment products. Their sensing of water quality may also offer a quality assurance recording for food safety if the system is capable of logging.

Other resources

- *Growing crops with reclaimed wastewater*. Daryl Stevens 2006 CSIRO Publishing.
- *Using recycled water in horticulture: A growers Guide*. Jarwal S et al 2006
- DPI Victoria, Victorian Government.
- State Guidelines
- www.nrw.qld.gov.au/compliance/wic/guidelines_recycle.html
- National Guidelines for water recycling. Managing Health and Environmental Risks. www.ephc.gov.au/ephc/water_recycling.html
- DAFF (2005) Guidelines for developing recycled water schemes for horticulture.
- <http://www.environment.gov.au/water/publications/urban/guidelines-hort.html>

For more details contact the Growcom members access line on 07 3620 3844.

Disclaimer: This information is provided as a reference tool only. Seek professional advice for irrigation specifics.

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