

# Managing variable quality surface water



## FACTSHEET

*A good intake setup is the cheapest “filter” you will ever buy.*

### 1. Introduction

Surface water from rivers, creeks, channels and dams can shift quickly from clean to heavily sediment-laden after rainfall, wind events, bank erosion, algal blooms or up-stream works.

Variable water quality drives frequent filter cleaning, uneven irrigation, clogged emitters, pump stress and wasted labour.

This fact sheet outlines practical, grower-tested approaches to intake screening, filtration selection, self-cleaning options, flushing routines, pressure management, maintenance schedules and when to test water.

### 2. Why it matters

Nut trees rely on consistent soil moisture for canopy growth, nut sizing and quality.

Dirty water can cause:

- Blocked drippers, micro-sprays or under-tree sprinklers, leading to dry patches and tree stress
- Reduced system flow and pressure, causing uneven distribution across blocks
- Higher pump energy use and wear (and risk of cavitation if intakes are restricted)
- Increased labour and downtime from manual cleaning
- Shortened life of valves, regulators, fertigation equipment and monitoring devices

### 3. “Dirty water” sources

#### Sediment and silt (fine particles)

- Quickly clog screens and disc filters
- Can slip through coarse screens and build up in laterals, causing ongoing blockages in emitters
- Increases differential pressure, reducing flow and causing uneven irrigation across blocks



This Riverscreen self-cleaning intake screen removes leaves, sand and weeds before pumping, thereby reducing wear and blockages. (Image: courtesy National Ag Solutions)

### 3. “Dirty water” sources (cont)

#### Organic matter (algae, leaf litter, biofilm)

- Creates slimy blockages and rapid pressure loss
- Can foul media filters and emitters, often worse in warm months

#### Iron, manganese & dissolved solids

- Can precipitate and form deposits, especially with aeration, chlorination or pH changes
- May require chemical management beyond simple filtration

### 4. Know your risk pattern

Before buying new gear, build a simple picture of when and why water turns dirty.

- Note dates when filters block rapidly and what happened upstream (rainfall, river rise, channel cleaning, wind, algal bloom)
- Record differential pressure across filters (inlet vs outlet pressure) and how fast it climbs
- Note whether blockages are gritty (sediment) or slimy/stringy (organic)
- Check which zones are most affected (often the furthest, highest, or smallest-diameter laterals)

If the same problem repeats, your filtration and flushing approach can usually be upgraded to reduce labour and stabilise performance.

### 5. Intake protection

A good intake set-up is your first line of defence. It keeps debris out of the pump and reduces the load on downstream filters.

- Locate the intake wisely: Avoid drawing from the bottom where silt concentrates.

- Avoid the surface if algae and floating debris are common.
- If using a dam, consider a floating intake or a multi-level offtake so you can draw from the cleanest layer.

#### 1. Common intake screening equipment (before the pump)

- **Self-cleaning suction screens (suction strainers):** rotating or jet-cleaned screens fitted to the suction intake, designed to shed debris continuously.



A mesh-panel self-cleaning suction strainer. (Image: Waterchem Australia. With permission)

- **Self-cleaning cylinder intake screens (wedge-wire ‘fish screens’):** stainless cylinder screens used on river intakes to keep debris and fish out while maintaining flow.

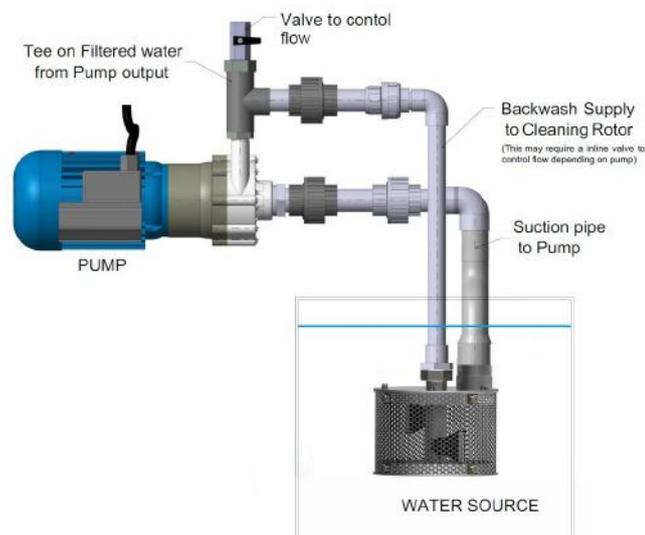
- **Brush- or jet-cleaned rotating screens (smaller pumps):** compact self-cleaning screens used on extraction points, often described by screen orientation and cleaning method.
- **Rotary drum intake screens:** larger drum screens used on raw-water intakes where debris loads are high (more common in industrial/municipal settings).

#### 2. Use staged screening

- Coarse trash screen or basket at the intake to stop sticks, leaves, fish, frogs and plastic
- Secondary screen upstream of the pump (where practical) to protect the impeller and reduce large loads on the main filters

#### 3. Manage suction conditions

- Keep suction line velocities sensible and minimise sharp bends to reduce turbulence and sediment draw-in
- Ensure the intake cannot be blocked against the bank or bed during low levels
- Regularly inspect for air leaks on suction lines (air leaks worsen pump performance).



**The Rotorflush system** uses self-cleaning intake screens to remove debris at the water source before it reaches the pump. This reduces blockages, lowers maintenance and helps maintain steady flow and pressure. (Image: Waterchem Australia. With permission)

## 6. Choose the right filters

Once you've protected the intake, the next step is choosing the right filters downstream — because what gets past the screen (fine silt, algae and organic matter) is what blocks emitters and drives maintenance.

No single filter suits all surface water. Start by matching the filter to the main contaminant (*sediment, organic matter, or both*)

The most reliable set-ups use two stages: a first filter to remove the bulk load, followed by a finer filter to protect emitters.

A common first stage is a screen filter, which removes larger particles before finer filtration.

### Screens (manual or automatic)

**Best for:** sand, grit, larger sediment, general protection

**Watch-outs:** can clog fast with algae or very fine silt if mesh is too fine

#### Practical notes:

- Automatic self-cleaning screen filters (backflush or suction-scanning) can cut labour dramatically in variable river water
- Choose mesh rating to suit emitter size and manufacturer guidance (*the goal is to protect the smallest restriction in the system*)

### Disc filters (manual or automatic)

**Best for:** mixed sediment and some organic load

**Watch-outs:** can clog up and restrict water flow with heavy algae or fine clay; needs correct backflush action

#### Practical notes:

- Many growers find disc filters forgiving for surface water, especially with automatic backflush

- Ensure the system can deliver the required backflush flow and pressure without starving irrigation.

### Media filters (sand/gravel)

**Best for:** organic matter, algae, fine suspended material

**Watch-outs:** larger footprint and higher initial cost; needs correct backwash rate and periodic media servicing

#### Practical notes:

- Media filters are often the best upgrade when the dominant problem is organic load or very fine particles
- Consider pairing a hydrocyclone (for sand) ahead of media to reduce load and backwash.



**Hydrocyclone (sand separator),** installed on an irrigation mainline, removes sand and grit from bore or surface water before it reaches filters and emitters. (Image: Netafim Australia With permission)

## 7. Quick diagnosis guide

If the ends of laterals are the first to run weak, it usually indicates pressure or flow loss along the line.

Common causes are:

- Partial blockages
- Friction losses from undersized pipework, or
- A pump that cannot meet peak demand.

Start by:

- Checking pressure where water enters and exits the block/zone
- Cleaning the filter
- Flushing laterals
- Confirming the pump is performing as intended.

**If pressure drops quickly** across filters, the filter is loading up with sediment or organic matter, or the mesh is too fine for the conditions.

A practical fix is staged filtration: coarser protection up front, then finer filtration downstream only if needed. Match the filter type to the main contaminant.

**Gritty build-up** in emitters usually means sand or silt is getting past the intake and filtration. Improve this by positioning the intake to avoid drawing from the bottom, adding a first-stage intake screen, and increasing line flushing.

Slimy or stringy build-up points to **algae or biofilm**, often in warm surface water.

Improve backflush reliability, consider filtration suited to organics (such as media filtration where appropriate), and if it persists, review treatment options with a specialist to suit your water source and system materials.



Australian Government  
Department of Agriculture,  
Water and the Environment

This project is funded by the Australian Government's Natural Heritage Trust