

Media filters

Media filters are effective in filtering both organic and inorganic contaminants. They have a large filter area or surface providing a huge holding capacity requiring less regular filter cleaning when compared to other filter types. Media filters are an efficient type of filtration for water heavily contaminated with algae, organic matter and other impurities often found in nursery recycled water.

Media filters operate by directing the pressurised water from the irrigation storage into the top of the filter tank or tanks. A diffusion plate in the top of each filter tank reduces the water velocity and distributes the water evenly across the top of the media bed, a 400 – 500mm depth of graded media. The media bed can consist of crushed silica sand, granite or other materials. The water percolates through the filter bed and passes through the open spaces between the sand particles in the filter tank where the impurities and contaminants are trapped in the filter bed. The filtered water then flows into the discharge manifold located in the bottom of each filter tank, before exiting the filter ready for use. The discharge manifold in the bottom of each tank consists of a sophisticated series of nozzles or mushrooms designed to prevent the silica sand from the filter bed entering the irrigation system.

Contaminates caught in the filter bed need to be regularly removed by the process known as backwashing. Backwashing the media filter flushes the impurities and contaminants removed from the water and trapped in the filter bed, to waste. During the backwash process, flush water flows evenly through the entire filter bed to ensure no pockets of contaminants are left behind. The flush water enters the filter through the mushroom shaped outlets (see photo) on the bottom of the tank and lifts and separates the filter media as it moves through the filter bed and dislodges any contaminants trapped during the filter process.

The process of media filter backwashing can be initiated manually, or automatically (via pressure switch or time). An automated backwash system for media filters using a pressure differential switch measures the differential pressure between the inlet and outlet to trigger the backwash cycle. When the pressure between the inlet and outlet increases to a preset level, the differential switch initiates the backwash process, and the process of flushing the contaminants from the filter bed continues for a predetermined time period. Automated backwash systems can also be initiated using a time clock. For systems with more than one media filter tank, the flushing process proceeds sequentially until all the tanks have been backwashed.

Media filters installed in production nurseries are often located either between the dam storage and the holding tanks to ensure only clean filtered water enters the tanks, or between the water source and the pressurised irrigation system. The backwash process interrupts the continued flow of filtered water and systems installed into production nurseries between the storage and irrigation system generally consist of a number of media filter tanks together in the system to facilitate sequential backwashing while the pressurized irrigation continues.

Selection of media filters for nursery production requires specialist advice from an irrigation professional. System specification requirements include:

- Preferred location of filtration within the total irrigation system
- System flow rate at filter location
- System pressure at filter location
- Water disinfection system and location within the system
- Level of contaminants in the water and seasonal changes
- Filter media type required



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