Screen or mesh filters

Water filtration is important with all irrigation, extending the life of, and lowering the maintenance and repairs on the entire irrigation system. Filters assist in ensuring the reliable operation of an irrigation system, reducing pump damage from solids in the water, ensuring efficient valve operation, and reducing blockages in the emitters (sprinklers and drippers).

Screen or mesh filters are historically the most common form of filtration used in production nurseries for the removal of foreign material from irrigation water, however these filters have often been operated beyond their limits. Screen/mesh filters continue to be a popular choice with production nurseries today, particularly within smaller irrigation systems, as a backup or final filter in the field, or extensively with drip irrigation.

Screen or mesh filters are popular because they are relatively inexpensive, versatile, easy to install, simple to use, have options for semi or fully automated cleaning, and are compact in size when compared to other filter types.

Screen filters collect debris on the screen surface, a stainless steel screen or fabric sock, until most of the available mesh openings are filled. At this point the grower will notice that the system pressure starts to fall as the screen becomes increasingly clogged with debris or in automated systems the pressure differential across the filter will instigate the flushing mode at a preset differential pressure.

Screen/mesh filters are often chosen as the primary filtration system, but are most often providing the secondary filtration in conjunction with media filter systems in production nurseries. These screen filters operate successfully in removing medium loads of inorganic hard contaminates, however high loads of organic contaminates such as algae, mould and slime, along with chemical contaminates can cause problems for screen filters. Chemical contaminates, such as iron or calcium precipitating out of the water can cause issues as these single surface filters have a limited capacity to store contaminates before cleaning is required. Organic contaminates present in the water often embed themselves into the filter mesh and do not readily release from the filter screen particularly during an automated cleaning process causing frequent and excessive flushing, and time consuming manual cleaning.

Screen filters are cleaned by flushing with a stream of water or removing the screen and cleaning it by hand. Small screen filters that are typically used in the field with drip systems or with smaller sprinklers in protective cropping, are simply pulled apart and the screen hosed by hand until all the waste material trapped in the screen is removed. Slightly larger units often have a flush valve at the bottom of the filter casing that can be opened to allow the screen to direct water across the screen to dislodge trapped particles and flush them away extending the periods between manual cleaning. Larger more expensive screen filters flush the screen by backwashing, forcing the water backwards through the screen for very effective cleaning. Automatic screen filters contain moving parts and can be costly, however, they handle more challenging water quality applications.

Filter cleaning can be initiated and completed manually or can be automated, however the screen/mesh may periodically require hand cleaning to remove contaminates not removed by the normal manual or automated cleaning processes. Most recently developed larger screen/mesh filters have been designed to allow for continuous flow of water to irrigation during the flushing process.
Manufacturers of screen filters offer a variety of screen/mesh options. The orifice size of the sprinklers or drippers used in the irrigation system will determine the screen/mesh selection. The specification sheet for

each sprinkler or dripper will outline the filtration requirements and therefore the screen/mesh size required. (rule of thumb is the screen/mesh size is one fifth the size of the emitter opening).

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

- Filter location within the total irrigation system
- System flow rate and pressure at proposed filter location
- Water disinfestation system and location within the system
- Level and type of contaminates in the water and seasonal changes
- Filter screen/mesh size required

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