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BASIC FILTRATION FOR MICRO-IRRIGATION SYSTEMS

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Proper water filtration is extremely important when using micro or "drip" irrigation systems. The plugging of micro-irrigation system emitters is a common problem associated with these systems. Suspended particles, biological growths and chemical precipitants can cause emitter blockage. Suspended particles such as sand, silt, clay, and any other particulate or organic matter in the irrigation water will plug a micro-irrigation system if allowed to reach the emitters. Any particles larger than the emitter opening must be eliminated before the water reaches the emitter. Most drip tape and emitter manufacturers recommend the removal of particles 75 microns and larger to prevent plugging the water emission orifices. The growth of algae or formation of chemical precipitants inside the lateral lines can also cause clogged emitters. Injection of chemicals to prevent the growth of algae or the formation of precipitants may be required to control these problems. Proper water filtration is a necessity with micro-irrigation systems. After micro-irrigation system emitters have been clogged there is little if any corrective action which can be taken.

FILTRATION METHODS

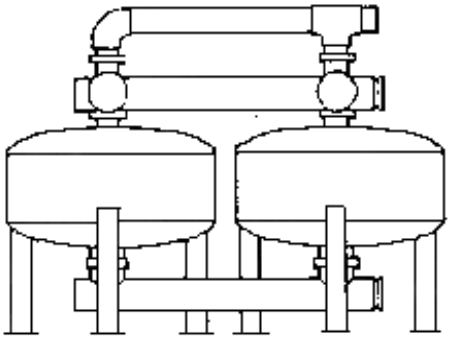
Sand media, screen, disk, centrifugal and gravity filtration systems are most commonly encountered. The type of filtration system required, or combination of types, varies with the irrigation water source and quality. The following sections provide a brief description of each filtration system type and the scenarios where they should and should not be considered.

CENTRIFUGAL SYSTEMS AND SETTLING BASINS

Settling basins and centrifugal separators separate water and particulate based on density differences. These systems are suited to remove large volumes of sand and silt particles, before further filtration. Particles must be denser than water to be removed centrifugally or by settling. These methods will remove sand and grit well, but will not remove particles as or less dense than water. While centrifugal systems work immediately, settling basins require retention time to be effective. Depending on the source water quality and the degree of filtration desired the needed retention time could be several hours up to two days. The primary use of gravity or centrifugal systems is as a pretreatment system to remove very heavy inorganic particulate loadings before further filtration. These systems are not recommended for filtering light material, such as organic matter.

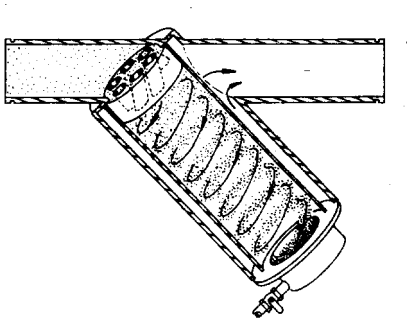
SAND MEDIA FILTERS

Sand media filters pass the irrigation water through a bed of sand where both organic and inorganic material is trapped. The filter beds must be periodically backwashed to remove the accumulated material trapped in the filtering process. Filters are usually operated in pairs or banks for back-washing purposes. Individual filters are backwashed one at a time using filtered water from the other filter(s). Sand media type filters will usually handle 15 - 25 GPM per square foot of filtration area, depending on water quality. Media filters are available with stainless steel, steel with an enamel coating or fiberglass housings. Sand media filters are the best choice for any surface water source, or other water source with organic contaminants. Sand filters are also very effective on inorganic particulate material. With proper media selection sand filters can be used to filter water from any source type.



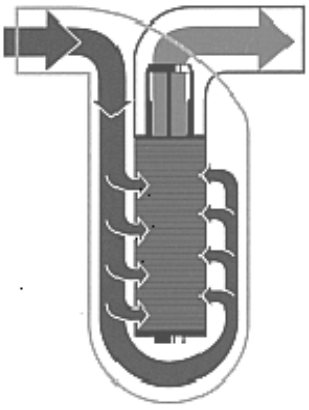
SCREEN FILTERS

Screen filters are effective at removing particulate larger than the filter mesh. They make effective, economical, secondary filters. Screen filters are effective at sand removal and should be used downstream of sand media filters to remove any sand washed out of the media filters. The use of screen filters as the primary filtration method is limited. Screen filters can be used as primary filtration under conditions where light loadings of inorganic particles large enough to be captured by the screen mesh are the only contaminate of concern in the water source. Screen filters should not be used when organic contaminates are present.



DISC FILTERS

Disc filters utilize multiple plastic disks or rings stacked together to form a filtration surface. These discs have grooves cut into them. When stacked on one another the grooves provide a three-dimensional filtering surface. These filters are compact in size and require lower volumes of water to backwash than sand media filters. Disc filters are effective at removing inorganic particulate material. High loading rates of organic material can quickly blind the filters. Disc filters can be used as primary filtration for irrigation sources where very little organic matter is present. Disc filters are an excellent choice for well or utility water sources.



FILTER SELECTION FOR MICRO-IRRIGATION SYSTEMS IN TENNESSEE

Wells in eastern and middle Tennessee seldom provide an adequate flow of water for irrigation on a commercial scale. Most east and middle Tennessee producers will depend on surface water for irrigation. In this scenario, sand media filters with secondary screen filtration is generally the best choice for production systems utilizing drip-tape micro-irrigation systems. In smaller flow systems where clean utility or well water is utilized, small disk filters will provide effective and economical particulate removal. In western Tennessee wells can provide much larger volumes of water and are commonly utilized as irrigation water sources. Sand media and large disk filters are both capable of providing good service. In wells where sand is the only contaminate of concern screen filters with properly selected filtration mesh may provide adequate filtration at a lower cost. It should be noted that different emitter types require different degrees of filtration. For example, drip tape requires a higher degree of filtration than most micro-sprinklers do. The type of emission device and its filtration requirement should be known when selecting a filtration system.

FILTRATION SELECTION GUIDE

	Sand Media	Disc	Screen	Centrifugal
Light Loading of Inorganic Particles	**X**	**X**		
Heavy Loading of Inorganic Particles	**X**	**X**		**X**
Light Loading of Organic Solids	**X**	**X**		
Heavy Loading of Organic Solids	**X**			
Sand Only > 100 Microns	**X**		**X**	**X**

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