



## Micro-Irrigation System Maintenance

By Robert Smith, Agronomist, Ultra Gro

In a tight water year, many of us are running our wells harder than usual and water quality will play an important role in our nutrition programs. And while we are asking a lot of our equipment, it is especially important to take extra care of our irrigation systems and keep the water flowing!

The life and reliability of a micro irrigation system is dependent on the regular routine maintenance. The greatest enemy of a micro irrigation system is blockage. Blockages reduce the irrigation efficiency and uniformity resulting in a reduction in crop value. Water quality varies from area to area *and during the season*. The purpose of preventive maintenance is to keep the emitters from plugging. Emitters can be plugged by suspended solids, magnesium and calcium precipitation, manganese-iron oxides and sulfides, algae, bacteria. Replacing any component of an irrigation system may be a significant financial investment. Regular inspection and monitoring of the system as part of a farm's irrigation management program can protect this investment. This checklist can provide information to troubleshoot and prioritize maintenance, including flushing of the drip lines, prior to any large investment such as replacement of system components.

Micro-irrigation systems tend to provide better distribution uniformity than other irrigation methods. Micro-irrigation systems can apply water and fertilizers more uniformly than other irrigation methods. This uniformity results in potentially higher yields, higher revenue, and reduced irrigation operating costs.

Distribution uniformity (DU) is an index that describes how evenly or uniformly water is applied throughout the field. A DU of 100% means the same amount of water was applied everywhere. Micro-irrigation systems have the potential for higher uniformity than other irrigation methods. However, clogging reduces the uniformity of applied water in micro-irrigation systems, thus increasing the relative differences in applied water throughout a field.

The small flow passages in the emitters and micro-sprinklers make micro-irrigation systems susceptible to clogging. Clogging reduces the uniformity of the applied water and decreases the amount of applied water. Clogging also decreases the amount of salt leaching around the lateral line in saline soils.

Routine Management practices –

Filtration systems require periodic inspection and maintenance. All filters should be checked and cleaned at the beginning and end of each season. Leaks repaired, pressure gauges properly operating, and back-flush systems are operational. Sand/Gravel filters need to be checked to ensure that sufficient time is allowed for back washing and that the back wash water appears clean at the end of a cycle. At the commencement of each season the media should be checked to ensure that it is coarse, clean, and sharp.

Automatic Disc filters inspect and clean the hydraulic command filter. Inspect filter discs - if necessary, remove and clean the disc. In case of slime or carbonate build up, chemical washing with acid or chlorine is recommended.



Screen Filters should be checked continually. Remove the screen and check for holes or other problems, also examine the screen for signs of corrosion. Back up filters need to be inspected and cleaned at the beginning and end of each season.

Control valves and pressure reducing valves should be checked at the same time for operation and correct pressure settings. Flush the mains and sub-mains ensuring that there is a good pressure and velocity to enable cleaning of the internal pipe. A high velocity is required to ensure an adequate cleaning action.

Lateral flushing should be carried out at the beginning and end of each season at the minimum. Local conditions will dictate the frequency of flushing, but frequent lateral flushing is often considered to be one of the most important practices.

The very small flow passages in the emitters can become clogged and reduce the DU of your system and water applied to your crop. A water quality analysis can often predict the emitter clogging hazard. If there is an indication that emitter clogging is likely, maintenance procedures can be implemented to mitigate the problem.

The first step in alleviating clogs is identifying the problem. Clogs can be caused by:

Particulates – sand, silt, clay – from surface water sources

Biological materials – algae, bacterial slimes – from surface water and groundwater sources

Chemical precipitates – such as iron and calcium carbonate – from groundwater sources or fertigation

Acids are often used to dissolve deposits of scale such as Carbonates, Hydroxides and Phosphates. Organic matter is not effectively treated by acids and hence the wide use of Chlorine. Chlorine is a very useful treatment for organic matter such as algae and bacteria. The strong oxidizing action of chlorine kills and decomposes organic matter and accumulated slime. Local conditions and practices will often be the best indicators for the use of chlorine. Keep in mind that chlorine can be detrimental to crops and the environment; because of this try to keep the use of such treatments to a minimum.