

- a method of filtering the irrigation water.
- a means of injecting chemicals into the water supply.
- in some cases a settling basin to allow aeration and the removal of solids.
- equipment for flushing the system.

Prevention of plugging can take two basic approaches: 1) removing the potential source of plugging from the water before it enters the irrigation system; or 2) treating the water to prevent or control chemical and biological processes from occurring. Both approaches will be discussed. In many cases, a combination of both approaches will be applicable.

Water Quality Analysis

Knowing the quality of proposed irrigation water is necessary before designing a micro irrigation system. Water quality analyses are performed at water testing laboratories (e.g. IFAS Soil and Water Testing Laboratory, University of Florida, Gainesville). A water analysis specifically for micro irrigation should be requested. The analysis should include the factors listed in Table 1. If the source is groundwater from a relatively deep well (over 100 ft), analysis for bacteria population may be omitted. Conversely, if the source is surface water, hydrogen sulfide will not be present and can be omitted.

Table 1 provides concentration levels for evaluating the water quality analysis in terms of the potential for emitter plugging.

A water quality analysis usually lists electrical conductivity in micromhos per centimeter ($\mu\text{mho/cm}$). To estimate parts per million (ppm) dissolved solids as shown in Table 1, multiply $\mu\text{mho/cm}$ by 0.64. For example, if the electric conductivity meter reads 1000 $\mu\text{mho/cm}$, then dissolved solids can be estimated as 640 ppm.

Hardness is primarily a measure of the presence of calcium (Ca) and magnesium (Mg), and is another indicator of the plugging potential of a water source. If Ca and Mg are given in ppm rather than hardness, hardness can be estimated from the following relationship:

$$\text{Hardness} = (2.5 \times \text{Ca}) + (4.1 \times \text{Mg}), \quad (\text{Eq. 1})$$

where calcium (Ca) and magnesium (Mg) are given in milligrams per liter (mg/L or ppm).