Drip System Maintenance

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Presentation available at: http://ucanr.org/schwankl
Maintenance of Microirrigation Systems:

Publication available at:
Emitters:

Clogging is the greatest “threat” to emitters.
Clogging of Microirrigation Systems

Source: Physical Clogging - Particulates
Clogging of Microirrigation Systems

Source: Physical Clogging - Particulates

Solution: Filtration
Filters:

- Screen, disk, and sand media filters are all available.

- They can all filter to the same degree **BUT**

  they req. different frequency of cleaning.
Screen Filters
Clogging of Microirrigation Systems

Source: Chemical Precipitates

- Lime (calcium carbonate) and iron are the most common problems.
Chemical Precipitate Clogging of Microirrigation Systems

Water quality levels of concern:

- Calcium: pH > 7.5 and 2.0 meq/l (120 ppm) of bicarbonate

- Iron: pH > 4.0 and 0.5 ppm iron
Clogging of Microirrigation Systems

Source: Lime

Solution: pH Control (Acidification) + filtration
Dealing with Iron Precipitation:

1. Precipitate iron in a pond / reservoir
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1. Precipitate iron in a pond / reservoir

2. Chemicals (e.g. phosphonic acid, phosphonate) may keep iron in solution
Clogging of Microirrigation Systems

Source: Biological Sources
Clogging of Microirrigation Systems

Source: Biological Sources

Solution: Filtration (usually media filters) + Biocide
Biological Clogging

Acid may deter but not eliminate

biocide

chlorine copper
Chlorine

- Sources:
  - Liquid - sodium hypochlorite.
  - Solid - calcium hypochlorite.
  - Gas chlorine.
Chlorine:

**Sources:**
- Liquid - sodium hypochlorite.
- Solid - calcium hypochlorite.
- Gas chlorine.

**When add chlorine source to water:**
- Forms hypochlorous acid + hypochlorite.
- Hypochlorous acid is more powerful biocide.
- If pH is lower (acidic), more hypochlorous acid is present - better biocide.
pH Effect on Hypochlorous Acid Concentration

Hypochlorous Acid Concentration (%)

pH

4  5  6  7  8  9  10
## Chlorine as a Biocide

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent growth</td>
<td>1 - 2 ppm</td>
</tr>
<tr>
<td>Periodic injection</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Super chlorination (reclamation)</td>
<td>500 - 1000</td>
</tr>
</tbody>
</table>

Test for chlorine using a pool / spa test kit
Chlorine: Injection Rates

- Sodium hypochlorite (liquid)
  - Example: household bleach w/ 5.25% active chlorine.

Chlorine injection = System flow x Desired Cl x 0.006 ÷ Strength of
rate (gal/hr) rate (gpm) Conc. (ppm) Cl soln (%)

- Calcium hypochlorite (solid)
  - 65-70% available chlorine.
  - 12.8 lbs. of calcium hypochlorite added to 100 gallons of water forms a 1% solution.
  - Use above formula.
Leaks in Microirrigation Systems

Source: Rodents
Leaks in Microirrigation Systems

Source: Rodents

Solution: Get rid of them.
Flushing of microirrigation systems:

- Silts and clay particles pass through even the best filters.
Flushes

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- Need to flush the system - mainlines, submains, and laterals (in that order).
Flushing

- Silts and clay particles pass through even the best filters.

- Need to flush the system - mainlines, submains, and laterals (in that order).
  - Flush laterals by hand, use automatic flushing end caps, or manifold the ends together.
Stay on Top of Your Maintenance