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.
Backwash Process

1. Contaminants suspended off media sand bed
2. To backwash disposal

Filtering Process

1. Flow Dispersion Assembly
2. From water source (via manifold)
3. Media Sand
4. Lakos Lateral/Underdrain Assembly
5. Filter Tank
6. Backwash Flow (from other filter tanks)
7. To system
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

- Prevent growth: 1 - 2 ppm
- Periodic injection: 10 - 20 ppm
- Super chlorination (reclamation): 500 - 1000 ppm

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 \times \text{Desired Cl} \times 0.006 \div \text{Strength of Cl soln} \%

  \text{rate (gal/hr)} \quad \text{rate (gpm)} \quad \text{Conc. (ppm)}

- 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.
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
Questions?

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