Drip System Maintenance

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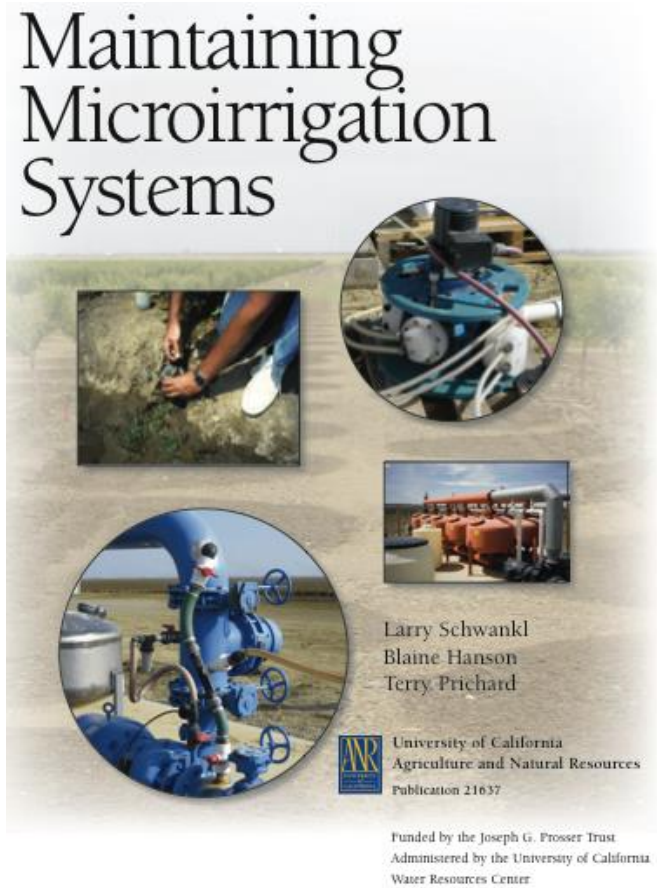
Presentation available at: http://ucanr.org/schwankl

Maintenance of Microirrigation Systems:

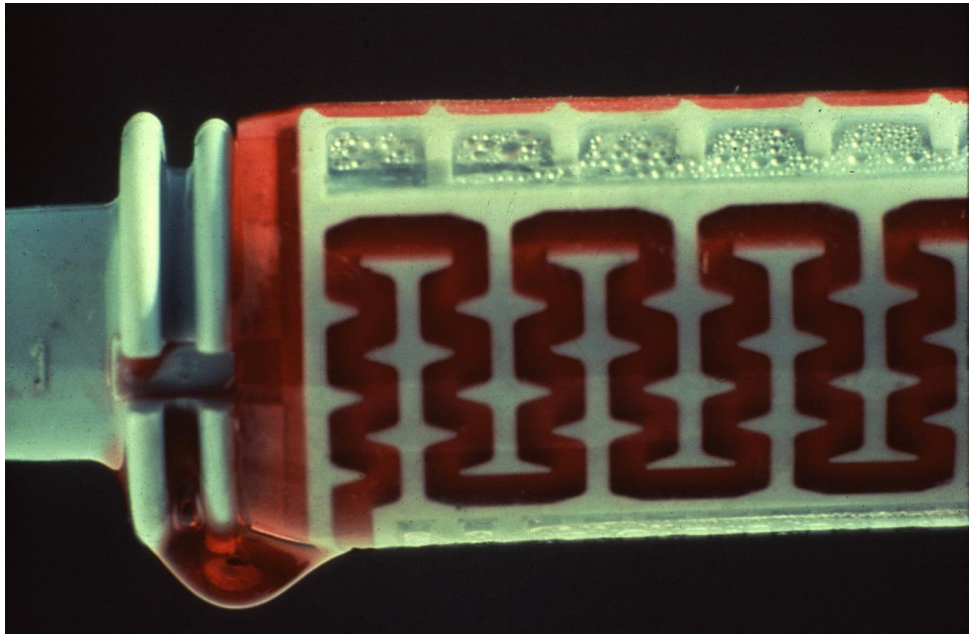


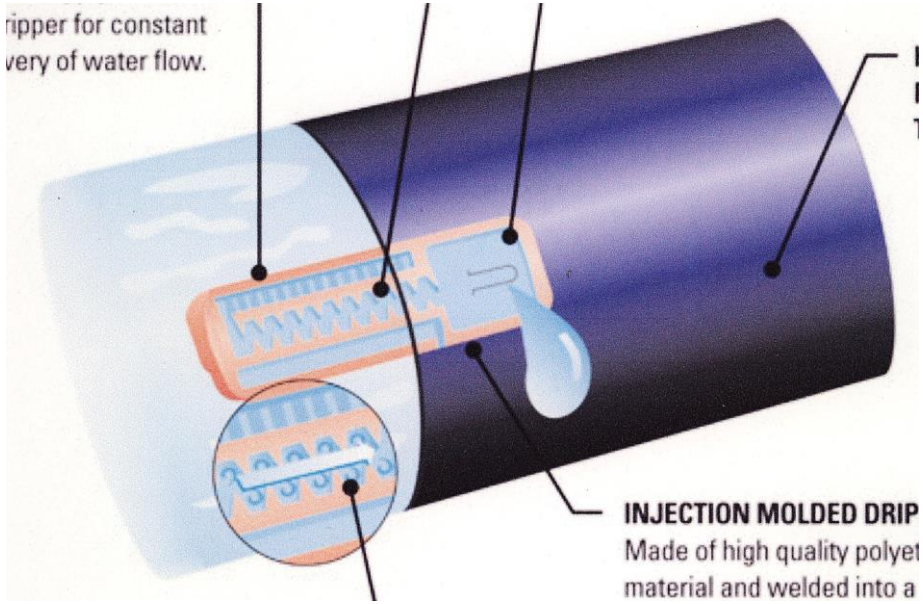
Publication available at:

http://anrcatalog.ucdavis.edu/Details.aspx?itemNo=21637

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:

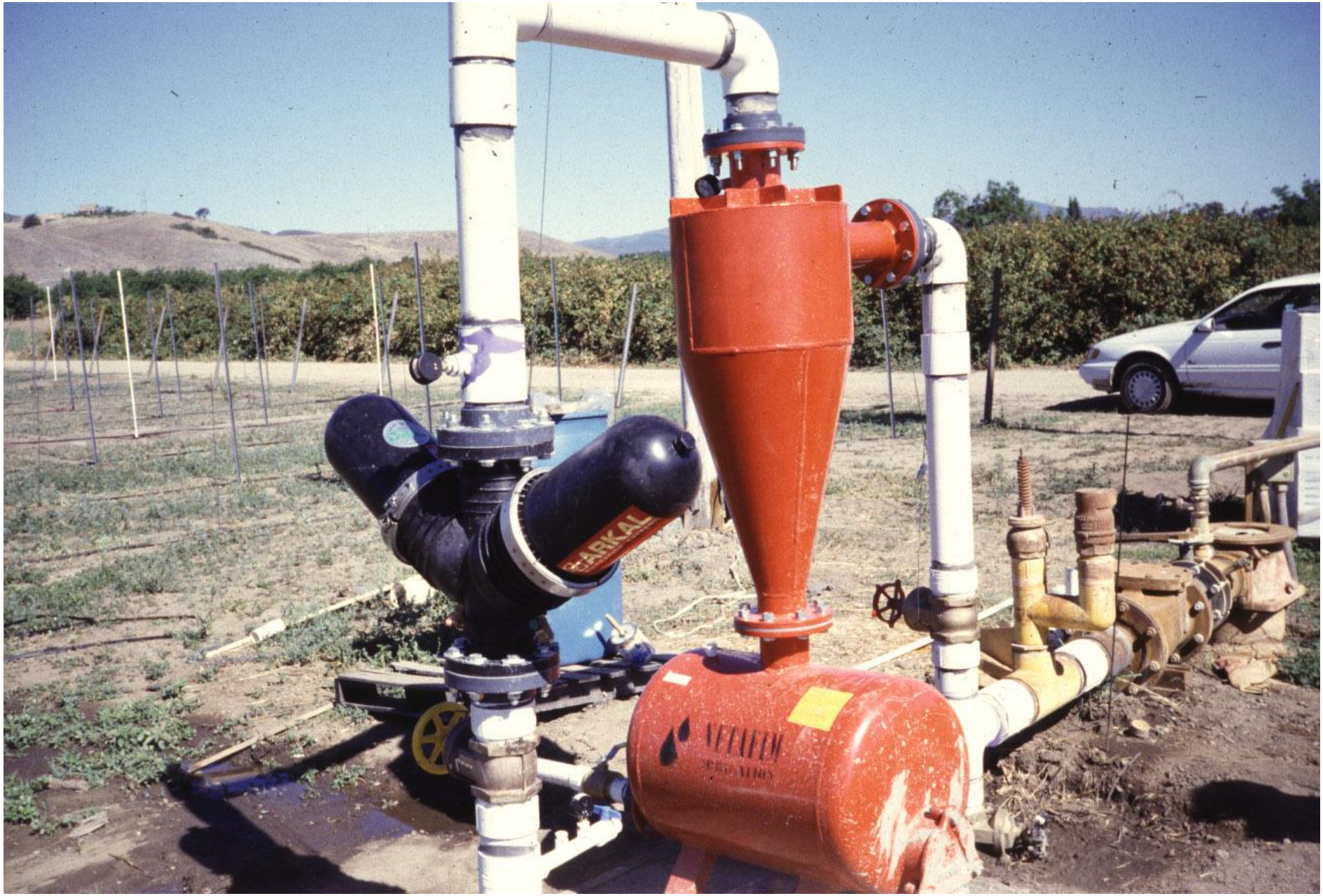
- **Screen, disk, and sand media filters are all available.**

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

BUT

they req. different frequency of cleaning.

Screen Filters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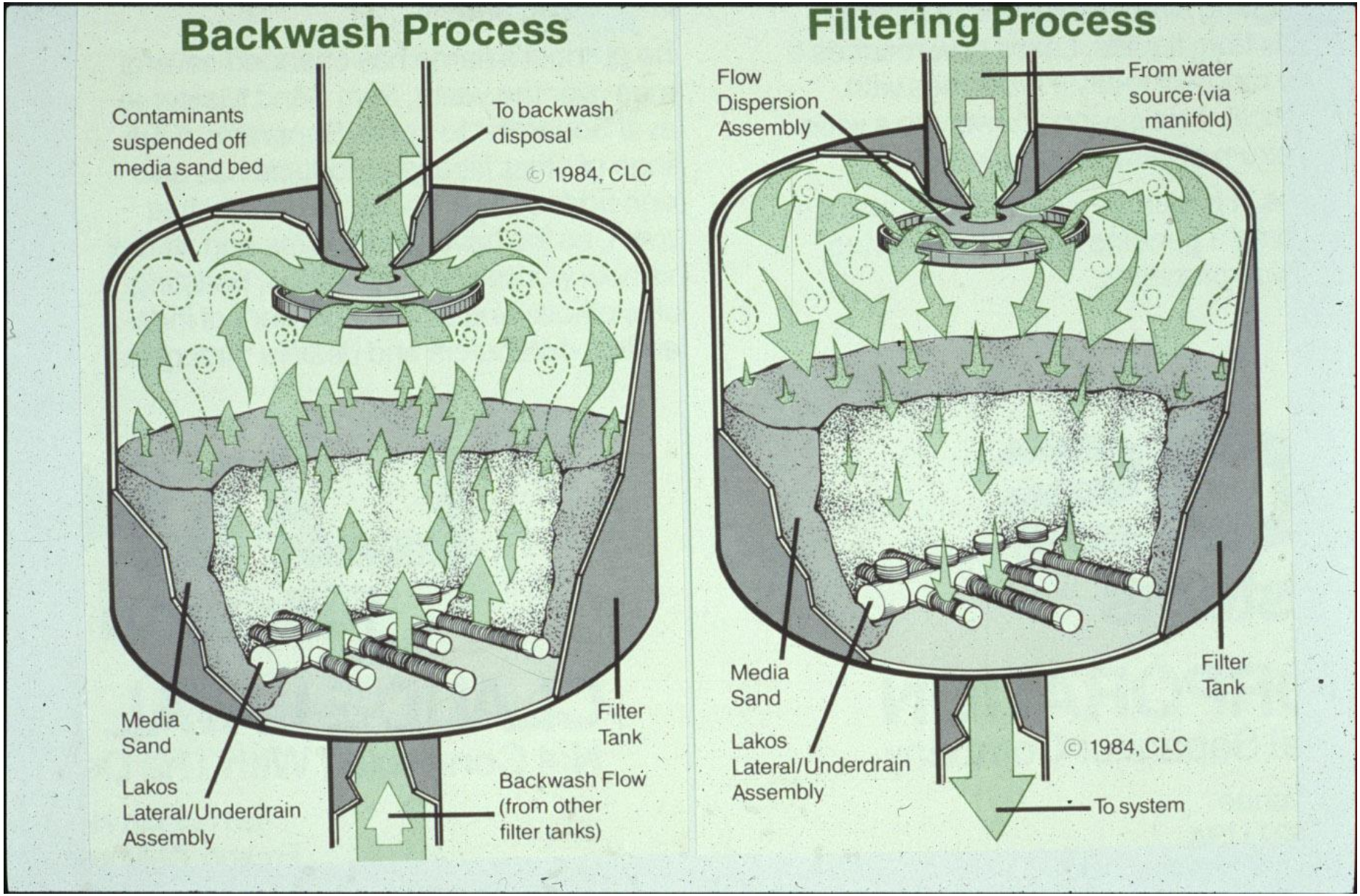
Backwash Process
Contaminants suspended off media sand bed
To backwash disposal
© 1984, CLC
Media Sand
Lakos Lateral/Underdrain Assembly
Filter Tank
Backwash Flow (from other filter tanks)
Filtering Process
Flow Dispersion Assembly
From water source (via manifold)
Media Sand
Lakos Lateral/Underdrain Assembly
Filter Tank
© 1984, CLC
To system


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IRRIGATION PRODUCTS
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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**

Dealing with Iron Precipitation:

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

Biolgical Clogging

Acid may deter
but not eliminate

biocide

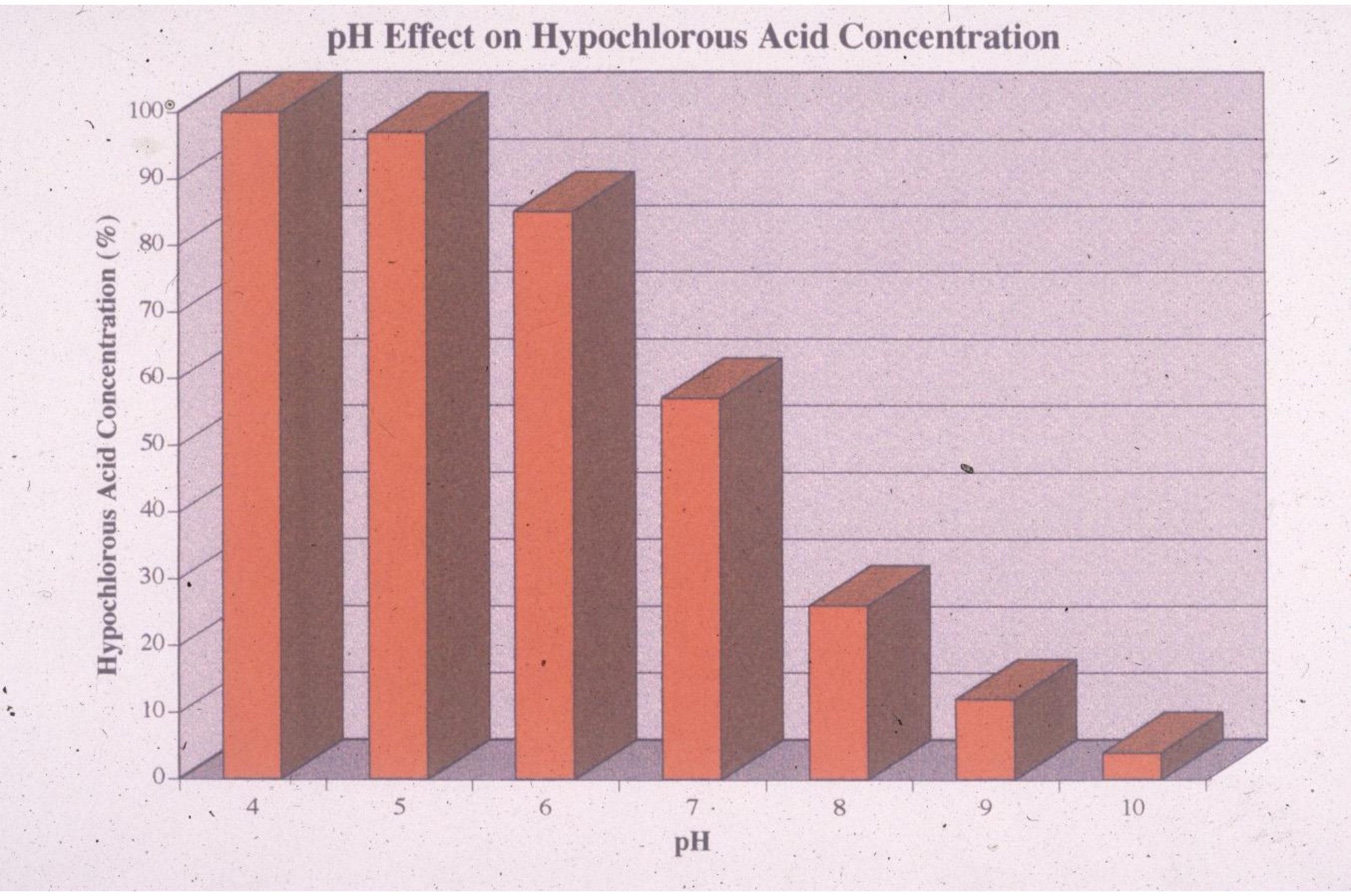
chlorine copper

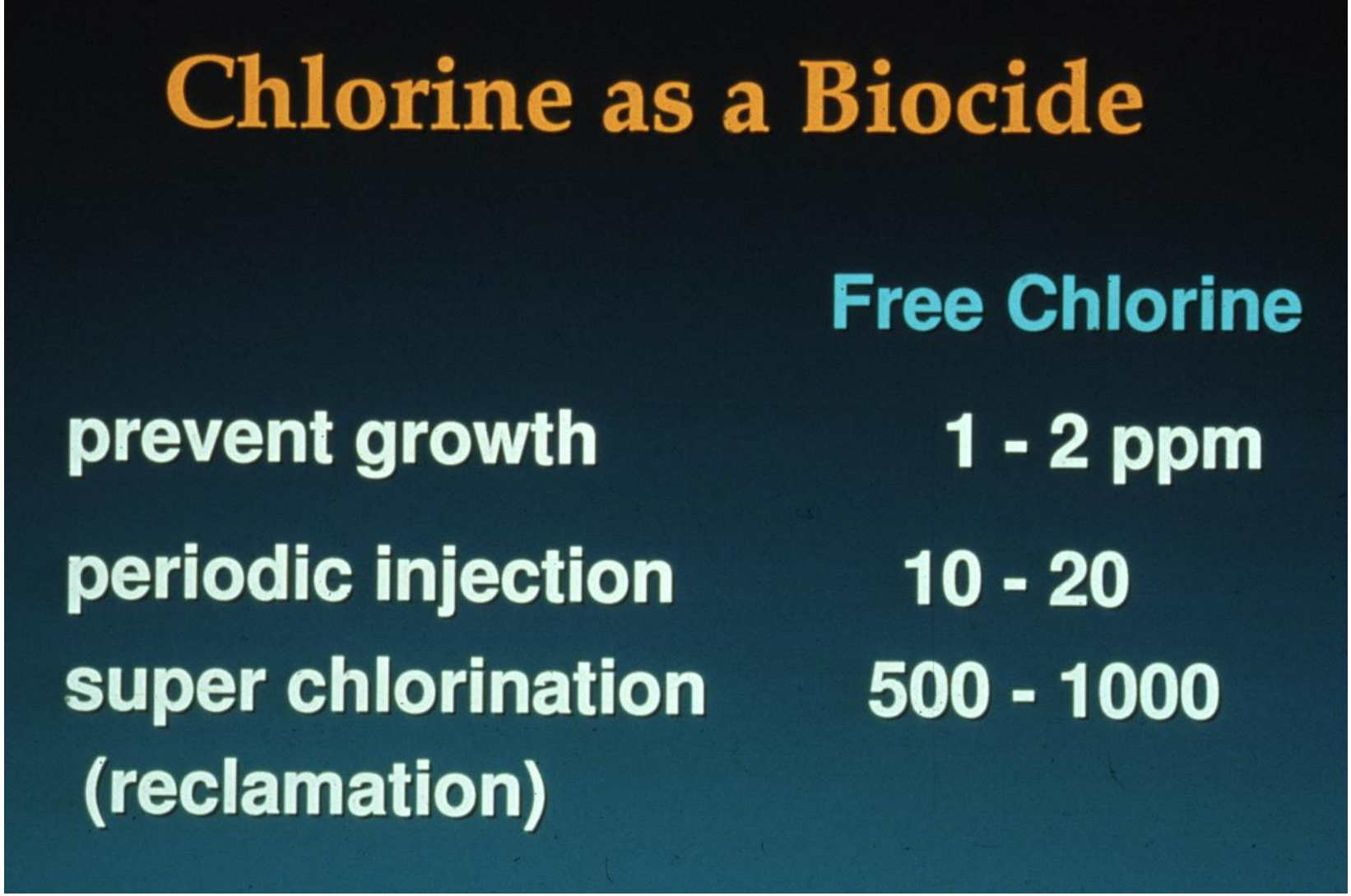
Chlorine

- 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 (%)
100
90
80
70
60
50
40
30
20
10
0
4
5
6
7
8
9
10
pH



Test for chlorine using a pool / spa test kit

Chlorine: Injection Rates

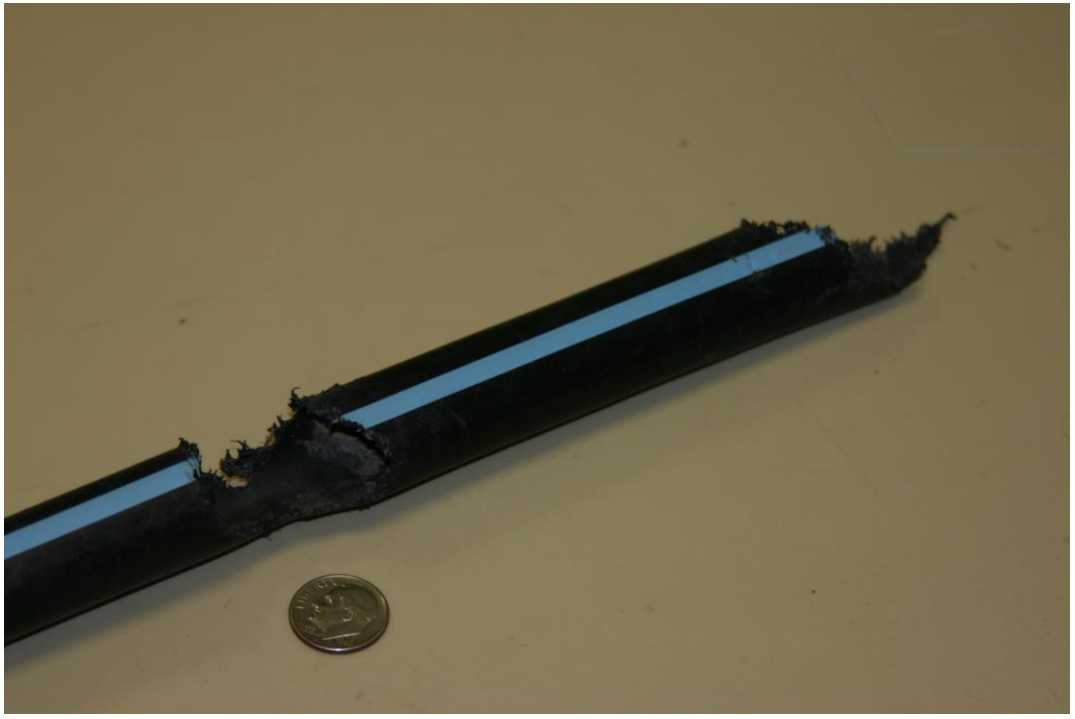
- Sodium hypochlorite (liquid)
  - Example: household bleach w/ 5.25% active chorine.

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

Flushing

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