

## Chlorine Injection

Chlorination is the most common method for treating bacterial slimes. If the micro irrigation system water source is not chlorinated, it is a good practice to equip the system to inject chlorine to suppress microbial growth. Since bacteria can grow within filters, chlorine injection should occur prior to filtration.

Liquid sodium hypochlorite (NaOCl) —laundry bleach— is available at several chlorine concentrations. The higher concentrations are often more economical. It is the easiest form of chlorine to handle and is most often used in drip irrigation systems. Powdered calcium hypochlorite (CaCOCl<sub>2</sub>), also called High Test Hypochlorite (HTH), is not recommended for injection into micro irrigation systems since it can produce precipitates that can plug emitters, especially at high pH levels (Tyson and Harrison, 1985).

The following are several possible chlorine injection schemes.

- Inject continuously at a low level to obtain 1 to 2 ppm of free chlorine at the ends of the laterals.
- Inject at intervals (once at the end of each irrigation cycle) at concentrations of 20 ppm and for a duration long enough to reach the last emitter in the system.
- Inject a slug treatment in high concentrations (50 ppm) weekly at the end of an irrigation cycle and for a duration sufficient to distribute the chlorine through the entire piping system.

The method used will depend on the growth potential of microbial organisms, the injection method and equipment, and the scheduling of injection of other chemicals. Ford (1979c) developed a key that recommends chlorine injection rates for Florida conditions and irrigation systems.

The amount of liquid sodium hypochlorite required for injection into the irrigation water to supply a desired dosage in parts per million can be calculated by the following simplified method:

$$I = (0.006 \times P \times Q) / m \qquad \text{Eq. 4}$$

where,

I = gallons of liquid sodium hypochlorite injected per hour,

P = parts per million desired,

Q = system flow rate in gpm,

m = percent chlorine in the source, normally 5.25 % or 10 %.

For more detailed information on injection rates, volumes and durations, the reader is referred to Clark et al. (1988).

When chlorine is injected, a test kit should be used to check to see that the injection rate is sufficient. Color test kits (D.P.D.) that