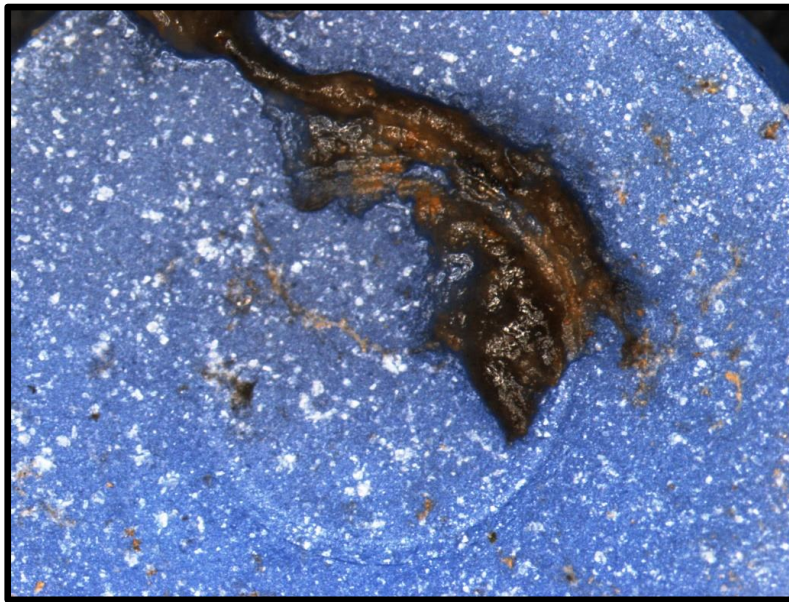


10/07/2017

Driplines – Not Sealing

The deposit over the dripper diaphragm is an organic matter – probably a biofilm which sticking to the diaphragm surface and prevent it from seal well. The source for this organic matter is the irrigation water.



Picture 1: organic matter over the sealing ring of the diaphragm.

The best treatment for organic matter is Chlorine/ Peroxide treatment. The objectives of the treatments are:

- Oxidation and decomposition of organic material
- Prevention of algae formation
- Prevention of agglomeration of organic particles
- Elimination of sulfur bacteria

Application methods:

1. Shock treatment – using 12% chlorine or 35% Hydrogen Peroxide

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There are some advantages for Hydrogen Peroxide over Chlorine:

- a. . Hydrogen Peroxide eco-friendly it does not leave negative residues in the soil after the application
- b. Too high concentration of chlorine might harm the diaphragm of PC drippers.
- c. Chlorine is more hazardous for health

Application dosage rate should be 1 liter of peroxide per 1m³ of irrigation water for a least 1 hour or until you get at the last dripline 1-2 ppm of surplus Hydrogen Peroxide (can be measured by peroxide test kit –contains a sticker to measure the concentration of peroxide 0-25 ppm). I recommend removing the control filters in the field and wash them manually with chlorine or peroxide prior to the treatment. After the treatment close the main valve and wait for the next day to flush the distribution and drip lines at high pressure.

Empiric formula for Peroxide with 35 % concentration:

$$\frac{2.5 \times Flow \left(\frac{m^3}{h} \right) \times Application (ppm)}{1000} = V (liters)$$

* Note the same can be done with Chlorine

2. Preventive treatment - using Chlorine or 35% Hydrogen Peroxide*:

Available forms of chlorine:

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- Gaseous chlorine (Cl₂, 100% active chlorine).
- Solid chlorine (calcium hypochlorite, contains 60-85% active chlorine). If the water contains high alkaline levels, hardness and/or high pH, it is recommended not to use this form.
- Liquid chlorine (sodium hypochlorite, contains 7-13% active chlorine). Liquid chlorine is unstable and decomposes quickly in the storage tank, depending on time, temperature and solar radiation.

It is recommended to inject a continuous low concentrated chlorine (or peroxide) for short time at least once a week in an amount that will create residual chlorine concentration of 1.0 ppm at the end of the last treated lateral. The specific injection frequency depends on the irrigation water quality (Fig 1.) The residual chlorine measured with the kit is the result of the injected quantity of chlorine less the quantity of chlorine consumed during the treatment due to its action, mainly on the existent organic/biological matter.

Note: It is dangerous to inject chlorine and acid into the same injection point at the same time. When it is necessary to reduce the pH using acid injection, chlorine and acid must be injected at two different points, with at least 3 meters between the two points.

* The same advantages of Hydrogen Peroxide are valid also in this case, so you may prefer using it in dosage of **1 liter per 10 m³/h** irrigation water flow.

Effect of temperature & pH on chlorination efficiency:

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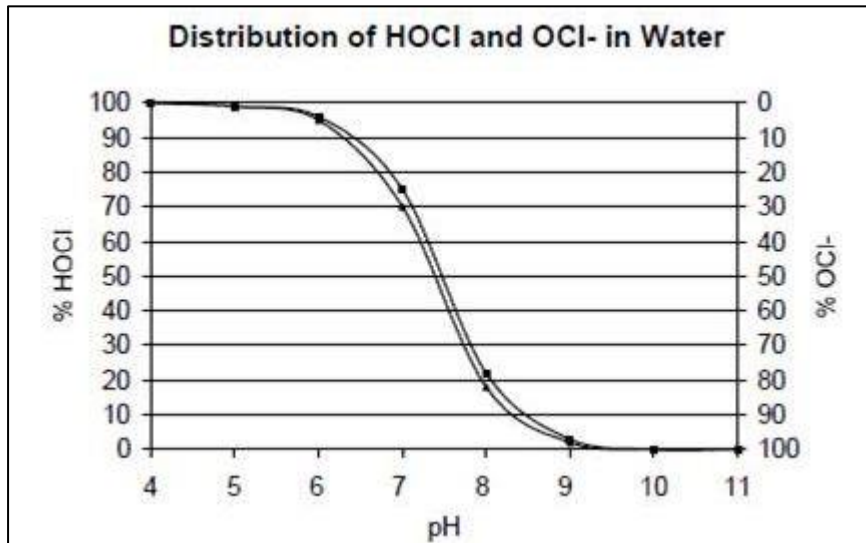
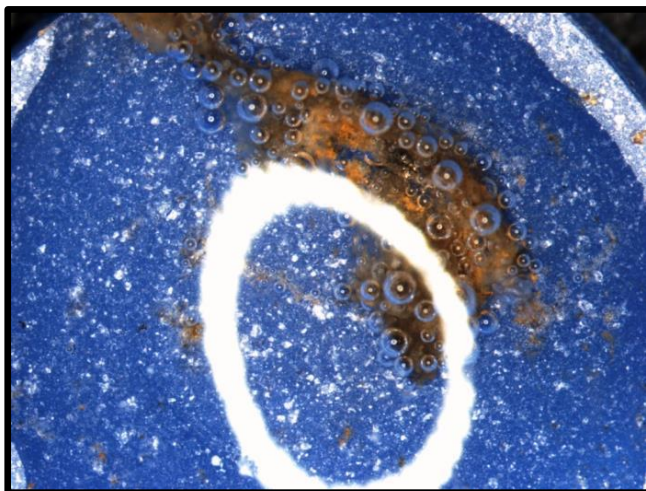


Fig1: Distribution of HOCl and OCl⁻ in water

- The more acidic the water, the higher the chlorination efficiency



Picture 1: reaction to Hydrogen Peroxide

Chlorine and Peroxide Treatments – General

- Aren't effective for prevention and dissolving mineral sediments.

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- Frequent treatments will reduce the risk of seal and dripper flow uniformity problems
- Hydrogen Peroxide and Chlorine are dangerous chemicals, therefore the manufacturer instructions must be read.

General Drip System Maintenance Guidelines:

Reservoirs:

- Maintain clean of sediments
- Avoid organic material grow
- Maintain clean the water inlet and pumping (suction) area

Filtration

- Keep the filter element in proper condition
- Check the pressure differential across the filter, inspect for leaks , clogging , tunnels and loss of medium (in case of gravel filter)
- Check the frequency of automatic flushing is normal
- Avoid the use of high concentration of Copper Sulfate (higher than 1 ppm) in the reservoir as it's highly corrosive

Main, Submain, Distribution and Drip lines:

Driplines systems require periodic flushing to purge them of settled debris, organic or mineral, and of any residues of chemicals injected into the system:

- Make sure that the irrigation system operates without leakages, from the head to the last dripline in the field
- Driplines systems require periodic flushing to purge them of settled debris, organic or mineral, and of any residues of chemicals injected into the system.
- Flush sub-mains, driplines and collectors at the beginning of every season
- During the season, flush driplines according to the water quality (clean water once a month , dirty water twice a month , very dirty once a week)
- Flush 5 - 6 laterals simultaneously
- Flush after every repair in the main lines or sub-mains

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I'm sure that by performing these steps and with periodic maintenance your system will work properly.

Amit Fischer

Agronomist IRRI-ALTAL

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