T-TAPE® MAINTENANCE - ACID TREATMENT

Acid is used to clean pipes and emitters of mineral deposits that have accumulated in the system over time. These minerals may have precipitated naturally from the water or by use of incompatible chemicals or fertilisers. Acid treatment may also be used to improve physical and chemical properties of your soil.

For effective acid treatment the total water solution pH should be reduced to between pH 2 and 3. At this pH the solution can effectively dissolve the accumulated deposits. However, care must be taken to avoid root damage by the acid.

In high value horticultural crops, the following procedures will reduce the root damage dramatically.

- Fill soil profile with usual irrigation water. This will allow immediate dilution as any acid enters the root zone.
- Calculate accurately the required injection time.
- Shut the system down after injection, leaving the acid solution in the line for a minimum of 1 hour and preferably 5 hours or more.
- Flush system thoroughly after acid has been in the system for a period of time.
- Although not essential it is preferable to irrigate for 1-2 hours following flushing to help dilute any residual acid that may be present in the soil.

Safety Precautions

Acids are dangerous and highly toxic. It is critical to read carefully and follow all instructions. Ensure that proper protective clothing, breathing apparatus and goggles are worn at all times when handling acids

Corrosion

Acids are corrosive to iron and some other metal products. PVC and polyethylene are resistant to the corrosive properties of acid. In order to avoid any damage from acid remaining in the system after treatment, maintain a continuous flow of water after treatment to flush the acid solution out of the system.

Type of Acid Used

- Hydrochloric Acid
- Sulphuric Acid
- Phosphoric Acid

1. Calculation of Injection Time

To establish the duration of injection time required for the material to reach the furthest point in the proposed block to be treated, work out the distance from the point of injection to the end of the furthest lateral, eg 600 m. Assume the average water velocity to be 1 m per 3 seconds.

Time required for the material to travel 600 m
=600 x 3 seconds
=1800 seconds or 30 minutes

Therefore the minimum duration of injection is 30 minutes

A very accurate procedure to ascertain injection time is to inject a dye following the pressurisation of the system. Measure time from injection until the colour solution reaches the furthermost point in the block to be treated.

If you wish to run a chlorine solution through each emitter for a minimum of 5 minutes, then simply add 5 minutes to your injection time calculated above.

2. Acid Calibration of Irrigation Water

The amount of acid required to reduce pH to, for example pH 2 may differ depending on the amount of dissolved salts in the water. Due to variations in water quality each water supply should be individually acid calibrated.

Example:

- Desired pH is 2
- pH of water supply is 7.5
- Fill 200 L drum from water supply
- Measure pH (in this example 7.5)
- Add acid in small measured amount and agitate until desired pH 2 is reached
- In this example 120 ml of phosphoric acid was applied

Therefore add 120 ml for 200 L or 600 ml for 1000 L (1 m^3) of water to bring the pH down to 2.

3. Calculation of Injection Rate of Acid

- Check the flow rate of the system; if possible use a flow meter. For this example, assume the flow rate is 31 000 L/hr which = 31 m^3/hr
- Duration of injection time = 30 minutes
- Amount of acid required to reduce water to pH 2 = 600 ml/m^3

Acid Required

= Acid Rate (ml/m^3) x Flow rate (m^3)

= 600 x 31

= 18 600 ml or 18.6 L

Acid required for 30 minutes of injection

= (Acid required (L) x Injection Time (Minutes)) / 60 Minutes

= (18.6 x 30) / 60

= 9.3 L

FOR MORE DETAILED INFORMATION-:

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