

Why Should I Use Sulfuric Acid?

By Joe Wantulok

I have been asked many times to explain the benefits of using sulfuric acid or a sulfuric based fertilizer to treat water in the southwest. To best explain this, first let's look at water in the southwest, especially reclaimed water. In our area, water has three primary detrimental components:

- 1) It is high in sodium salts, which poison the soil and damage plants.
- 2) It is high in bicarbonates which seals the upper layers of soil and hinders water percolation, and also causes detrimental scale buildup in irrigation systems.
- 3) It is high in pH, which prevents nutrients from going into solution and being utilized by plants.

When we add sulfuric acid to our water, the following takes place:

- 1) Sulfuric acid reacts with bicarbonate (HCO_3) in the water as follows:
 $\text{H}_2\text{SO}_4 + \text{HCO}_3 = \text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2 + \text{H}^+$ (sulfate, water, carbon dioxide, H Ion)
- 2) The CO_2 gasses off
- 3) The water joins the other water.
- 4) The H^+ lowers the pH
- 5) The SO_4 reacts with available calcium to form CaSO_4 (gypsum)
- 6) The gypsum displaces sodium on the soil particle.

So, in a nutshell, acid injection does the following:

- 1) Hinders scale buildup in irrigation systems, and dissolves existing scale.
- 2) Opens up the soil to aid water percolation
- 3) Lowers the pH to aid in nutrient absorption.
- 4) Aids in the leaching of sodium from the soil.

In conclusion, generally speaking, if you have high bicarbonates, high sodium, and high pH, you will benefit from the addition of sulfuric acid, or a sulfuric based product. It will positively impact your turf and ornamentals, and make your fertilizers work more effectively.