

Products of **AQUA-AID, INC.**



Miller's Miscellaneous

Spring is here and the usual tasks are going on whether it be golf or lawn-care or sports turf. Plenty of soil amending and prep for a good season of sports.

Water issues are the main part of this second quarter-2011 newsletter. In our travels, we see more and more misunderstanding about how to

deal with poor water quality. I hope to clarify some of these issues with this newsletter and accompanying articles.

And lastly, we look at three water tests. These water tests will prove the need for soil amending. It is a very interesting, eye opening lesson that will show and prove the point of

amending with calcium to provide better growing conditions.

Let's hope for a successful year and a prosperous year that leads to economic recovery of the turf industry.

I hope you enjoy the newsletter.



When Bad Things Happen to Good Water!

It's beginning to happen more and more. Turf managers that had good, decent water at their disposal, now are beginning to be forced into using effluent water to treat the same turf and ornamentals. We, here at AQUA-AID, see this trend more and more. It never seems to surprise us that in areas where water is known to be so plentiful and always clean... ends up being the places where turf managers are forced to deal with change over to poor water sources. While some of you still have the "good stuff", others right down the street are seeing a change. A good water source provides many things:

1. Balanced pH
2. Available nutrients
3. Better performance of pesticide applications
4. Peace of mind
5. Better infiltration.

When forced to change over to effluent or a poor water source, many, if not all, of the positives are quickly turned around to be negatives and begin to work against you.

1. pH is now alkaline
2. Nutrients begin to tie up.
3. More concern over the longevity of pesticide applications.
4. Constant monitoring of the water quality.
5. Poor fertilizer performance.
6. No peace of mind... well you understand!

Most important for you, if this is your situation, is to get educated. You can contact any AQUA-AID rep for further education on dealing with poor water quality. We have extensive knowledge and resources to help you better deal with your situation.

Special Interest Articles:

- Miller's Miscellaneous
- When Bad Things Happen to Good Water
- Guides to Water Treatment and Soil Amending
- Common Questions About Treating Water
- Proof that Water Treatment Requires Soil Amending
- Interesting Facts About Water

Jim Miller
Sales Manager
843-241-5717

Bo Phillips
Regional
Account Manager
210-382-4079

AQUA-AID, INC.
Corporate Office
800-394-1551

Bad Things - Good Water cont.

"Is life so dear, or peace so sweet, as to be purchased at the price of chains and slavery? Forbid it Almighty God! I know not what course others may take; but as for me, give me liberty, or give me death."

Patrick Henry

The first issue many turf managers begin to wonder is: "Should I treat my water or not?" The answer here requires a lot of education and a lot of research. In many cases, what is considered bad water, is perfectly alright to grow good turf with. In other cases, it is not.

Issues such as: Sodium Absorption Ratio (SAR), Electric Conductivity (EC), Sodium, Bicarbonates, and Carbonates are factors that need to be well understood. More importantly it is the interaction of these factors that will ultimately determine your course of action to treat or not to treat your water. **Regardless of the water situation, the soil still needs amending with calcium to offset many of the negative inputs once delivered to the soil through irrigation.**

To sum up the issue of what poor water quality does to soil can be

made in one basic sentence. **Poor water in one way or another robs the soil of its positive inputs and replaces those positives with negative inputs.**

What are the positive inputs:

- Soluble/Available nutrients. Especially calcium
- Good drainage
- Proper fertilizer results.
- Good color to turf
- Less disease pressure
- Better rooting and nutrient uptake
- Less wilt/heat stress
- Oxygen/water ratio balance
- Balanced pH.
- And there are more

What is causing the positives to be reversed? The answer to this is based on several things. Bicarbonates will replace available calcium with sodium. Depending on the severity of Bicarbonates, this reversal of nutrient exchange is the beginning of all the other

negative inputs. It really depends on the levels of each negative input. As they interact with each other, it can create a poor soil environment in which turf can still grow, or, it can create a very bad soil environment in which turf cannot grow unless further action is taken. So educate yourself and find the people who can answer your questions, and rely on that information.

We see in our travels, a large percentage of people providing poor advice on how to deal with bad water quality. We see only a small percentage who really know what they are talking about and can be relied on. **The following article contains a water interpretation chart and a link to another chart to decipher whether water needs treatment, and if soil needs amending to offset the negative inputs from bad water.**

"Pride gets no pleasure out of having something, only out of having more of it than the next man".

CS Lewis

Go to <http://www.verde-cal.com/west/pdf/testing-brochure.pdf> for more Soil and Water Interpretation charts.

Guides to Water Treatment and Soil Amending:

These charts can be used to help you better understand just what you may need to do with your water source. As you learn from a good water test, you can have high SAR and have an EC measurement. This does not always mean you need to treat the water. To the untrained, it certainly may. In some cases you will, and in other cases you won't. In many cases you can treat the soil with VERDE-CAL and reverse the negative inputs of that water to create a better "solution side" of your water in the soil. I have found this chart to be the best help in allowing a turf manager to really understand what course of action they need to take with their water issues. **In some cases this chart has saved thousands of dollars.** And in other cases, it has certainly helped turf managers better educate their committees or owners of what the water is doing to the soil, and thus affecting the turf.

In cases of:

Severe Reduction in Infiltration - soil amending is a must, but also, may be the need for treatment of the water source to bring down the pH.

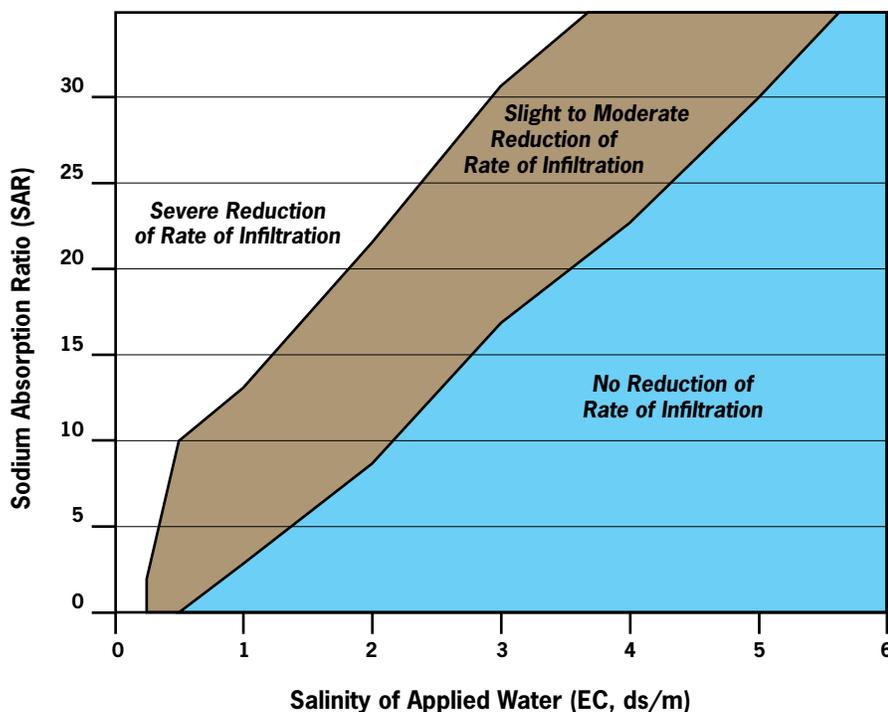
Slight to Moderate infiltration - could still require water treatment, but definitely still needs soil amending.

No Reduction of infiltration - you still may need the amending due to the EC, but treatment of the water may not be needed.

VERDE-CAL Products fit in very well for all categories your water may put you in.

Sometimes all you need to do is amend the soil with proper amounts of calcium to condition and flocculate the water and soil. By doing this you create better soil life and a better foundation for the turf to grow.

"Service to others is the rent you pay for your room here on earth."
Muhomad Ali



Remember, soil amending is needed for three reasons:

1. Nutrients "tie up" and need to be released.
2. Plants take up nutrients "in solution". Soils leach nutrients.
3. Soils need flocculation to create conditioning of water and exchangeable nutrients.

An interesting occurrence happened about 25 minutes before 1:00pm on May 6th, 1978 and it involved numbers on a clock & month & year on the calendar. What was this numerically interesting moment? Early that afternoon, the time/date read:
12:34 on 5/6/78

Treatment Prescription

 **VERDE-CAL G, Acidiphly, and/or Salt-Aid**.
Acid water treatment REQUIRED.

 **VERDE-CAL G, Acidiphly, and/or Salt-Aid**.
Acid water treatment potentially not needed.

 **VERDE-CAL G, Acidiphly, and/or Salt-Aid** as needed.

"It is not the position, but the disposition"
Susan Sontag

Common Questions About Treating Water:

1. Can I lower my Sodium Absorption Ratio (SAR)? Yes you can. Addition of VERDE-CAL G and other calcium sources such as calcium nitrate or our AcidipHy product will help lower the SAR.
2. Will acid injection lower my SAR? No it won't. Acid injection has little to no effect on calcium, magnesium or sodium in the water itself. The Ca, Mg, Na are the salts. Once the soil is flocculated with these amendments, the SAR can be lowered. The acid injection will lower the pH of the water, and have very little effect on the other areas of water.
3. I have high pH water. My bicarbonates are fine, my other salts are fine, should I treat the water so the soil pH won't go any higher? Many ways to answer this. Do you get rainfall regularly? If so, you may get away without treatment. What type turf are you growing? How high is the pH of the water? 7.2? 8.5? We see some turf managers inject acid to simply lower the water pH and nothing else. What is your budget? Can you afford the equipment and yearly amount of budgetary dollars to inject an acid product into irrigation?
4. How do I best treat for SAR, pH, high Bicarbonates and high Electric Conductivity (EC)? It really depends on the severity of infiltration reduction. If it is severe, then water treatment and soil amending are an absolute must. This, if done correctly, will help treat: SAR, pH, bicarbonates, EC as well as other salts that may be a problem. Refer to our charts provided in the previous article.
5. Why do I still need to amend the soil if I am treating the water? You still need to "flocculate" the soil with available calcium because the water treatment only treats the pH. You still have to treat the other problems, especially sodium. Your infiltration may be a problem, and calcium will help fix that. This creates better nutrient release and utilization.

"You can't judge right from looking at what's wrong."

Bo Diddley

Proof that Water Treatment Requires Soil Amending:

Here is a great example of a bad water situation. The golf course has tested the well water three times.

1. Well water untreated.
2. Lake water diluted with the well water.
3. Irrigation water treated with Infuric Acid,

Notice the highlighted areas. When diluting the well water with rain water, there is a big change in the negative inputs: Carbonates, Bicarbonates, SAR, EC. pH did not change that much.

Once that lake water was treated with the acid injection you will see these differences: pH drops

and carbonates drop. All other negative inputs remain relatively the same.

So, the question to ask yourself is: How do I get rid of the leftover negatives in the water?

The bicarbonates, sodium, EC, are all still there!

The answer is: You must condition them in the soil! And this can be done by flocculating the soil with calcium sulfate – VERDE-CAL G.

Yes the lower pH of the water will certainly help, but these negative inputs must still be dealt with and leached or you have done very little to improve your situation.

Education of how to deal with poor water is all too important. To the untrained eye, the education may stop with a sale of injection equipment and some product to inject. You really have to re-think your entire fertility program when dealing or switching to poor water sources.

It can be an incredible challenge for the best of us to deal with.

Be assured that VERDE-CAL Products are very capable of handling the soil needs and treatment of bicarbonates, sodium, EC and high pH.

Do you remember the first music video played on MTV?

Band was:

The Buggles

The song was:

Video Killed the Radio Star.

(how appropriate!)

Water Treatment and Soil Amending cont.**Water Test Analysis Comparison: WELL, POND, and TREATED IRRIGATION**Sample Name: **WELL**

Nitrate Nitrogen: 0.4 <i>L</i>		Carbonate: 25.5 <i>H</i>
		Bicarbonate: 699.98 <i>VH</i>
Phosphorus: 0.09 <i>L</i>		pH: 8.4 <i>H</i>
Potassium: 9.48 <i>N</i>		Conductivity: 1.28 <i>M</i> <i>mmhos/cm</i>
Calcium: 1.63 <i>L</i>		Total Dissolved Solids: 821.76 <i>M</i>
Magnesium: 1.03 <i>L</i>		Sodium Absorption Ratio (SAR): 39.3 <i>VH</i>
Sodium: 261.46 <i>VH</i>		
Chloride: 134 <i>M</i>	Residual Sodium Carbonate (RSC): 12.155 <i>meg/l</i>	
Sulfate: 0.31 <i>L</i>		
Boron: 2.79 <i>VH</i>		
Results reported in ppm unless otherwise noted.		

Sample Name: **POND**

Nitrate Nitrogen: 1.4 <i>L</i>		Carbonate: 10.2 <i>N</i>
		Bicarbonate: 376.37 <i>H</i>
Phosphorus: 0.09 <i>L</i>		pH: 8.2 <i>N</i>
Potassium: 13.41 <i>N</i>		Conductivity: 0.92 <i>M</i> <i>mmhos/cm</i>
Calcium: 25.37 <i>N</i>		Total Dissolved Solids: 588.8 <i>M</i>
Magnesium: 3.03 <i>L</i>		Sodium Absorption Ratio (SAR): 9.01 <i>VH</i>
Sodium: 180.68 <i>VH</i>		
Chloride: 100 <i>M</i>	Residual Sodium Carbonate (RSC): 4.9926 <i>meg/l</i>	
Sulfate: 65.04 <i>N</i>		
Boron: 1.53 <i>VH</i>		
Results reported in ppm unless otherwise noted.		

Sample Name: **IRR TREATED**

Nitrate Nitrogen: 22.5 <i>N</i>		Carbonate: 0 <i>L</i>
		Bicarbonate: 376.07 <i>H</i>
Phosphorus: 0.11 <i>N</i>		pH: 7.4 <i>N</i>
Potassium: 13.87 <i>N</i>		Conductivity: 0.98 <i>M</i> <i>mmhos/cm</i>
Calcium: 24.82 <i>N</i>		Total Dissolved Solids: 629.12 <i>M</i>
Magnesium: 2.86 <i>L</i>		Sodium Absorption Ratio (SAR): 9.73 <i>VH</i>
Sodium: 192.41 <i>VH</i>		
Chloride: 100 <i>M</i>	Residual Sodium Carbonate (RSC): 4.6891 <i>meg/l</i>	
Sulfate: 88.94 <i>N</i>		
Boron: 1.62 <i>VH</i>		
Results reported in ppm unless otherwise noted.		

NOTICE:
These test indicate that water treatment positively effected pH but did little to address high bicarbonate, high SAR, and high sodium.

Finish the Soil Treatment with:

VERDE-CAL® G

AcidipHy™

Salt-Aid™

* Water analysis provided by Waters Agricultural Laboratories, Inc.

Interesting Facts About Water:

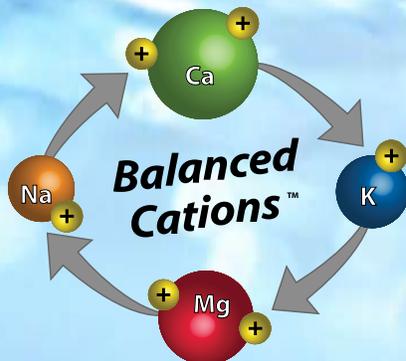
- Water dissolves more substances than any other liquid. Wherever it travels, water carries chemicals, nutrients, and minerals with it.
- The total amount of water on the earth is about 326 million cubic miles of water.
- Of all the water on the earth, humans can use only about three tenths of a percent of this water. Found in underground aquifers, rivers and lakes.
- The US uses about 346,000 million gallons of fresh water every day.
- The average person in the US uses about 80 to 100 gallons of water per day. Flushing the toilet takes up most of this.
- 1.2 billion people worldwide have no access to clean water.
- To desalinate water in the US costs anywhere from \$1 - \$16 per 1,000 gallons of finished fresh water.
- You can refill an 8 oz. glass of water approximately 15,000 times for the same cost as a six pack of soda.
- Only about 2% of the water on earth is fresh water and useable for human use.
- Over 90% of the world's fresh water is located in Antarctica.
- The Amazon River puts so much water into the Atlantic Ocean that 100 miles out to sea from the mouth of the river, you can dip a cup into the ocean and still have fresh water.
- Water is the only substance found in our world in three forms: liquid, solid, gas.
- A cow will consume four gallons of water to produce one gallon of milk.

If you need more literature, please request some to be mailed to you by contacting one of the following:

maryanne@aquaaid.com
scott@aquaaid.com

Specify how much you need and where to mail it to.

**FEED THE SOIL AND THE SOIL
WILL FEED THE PLANT.**



800-394-1551
www.aquaaid.com