



## Miller's Miscellaneous

The last day of winter was just a few days ago. Warm weather seems to be surrounding everyone! The economic mood seems much better thus far, this year. We attribute this mainly to the fact that many areas that normally don't see any business in January and February have actually seen some rounds played!

Tiger Woods just won his first PGA event (his first since 2009), the Arnold Palmer Invitational. By the time this newsletter comes

out, the Masters Tournament will be over, and a new champion will be crowned! All good news to get golf off to a great start in 2012!

This time of the year we get questions about "calcite calcium". Read the related article and learn exactly what this source of calcium is.

Another great read is the: Granular vs. Liquid, and which works best for soil amending. There is a big difference when

amending soil with these sources of nutrient.

And lastly, a Salt Meter is a great tool to use not just to help you control salts in your root zone... but also to help you "understand" what those salts are doing for you in the root zone! Pretty good information and useful guides to help you succeed this year!

Good Luck this spring/summer season!

### Special Interest Articles:

- Miller's Miscellaneous.
- Calcite Calcium
- Granular vs. Foliar
- Pass The Salt
- Salt Meters

## Calcite Calcium: What it is, and how to use it.

We get calls all the time about "Calcite Calcium" (CC). What is it? Who sells it? What does it do? How does it differ from other calcium sources? Where can it be found?

CC is found all over and is a product that most everyone has used at one point or another, whether you know it or not! You even ingest it during many meals!

When you Google CC, what first comes up is "the mineral calcite". Better known as Calcium Carbonate.  $\text{CaCO}_3$  is the chemical description for calcite calcium. CC is used in cement, lime, glass, food preservatives, steel production as well as many other uses. Begin to sound familiar? Yes, if you are looking for CC, than simply ask for high calcium lime! Or, better yet, VERDE-CAL! Read on.

Where the confusion enters in, is that there is a product in the market literally called Calcite Calcium, which is simply  $\text{CaCO}_3$ . I think a company called their product this in order to market it better vs. that of other similar sources. The fact is, whether it is called CC or hi cal lime there are some downsides to using this source of calcium derived from Calcite.

1. Must be incorporated into the root zone.
2. Needs oxidation to release. Plan on about three years.
3. High spread rates to amend soil properly.
4. More waste.
5. More labor and inventory needed.
6. Mower pickup

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**Calcite Calcium cont.**

There are some positives to CC or hi cal lime.

1. Usually inexpensive
2. Can be bought from just about any supplier.

Because of CC's downsides, it is not usually the easiest or most efficient source of Ca to use. In turf, we must have something better. A product should not need incorporating into the root zone. It should release quickly so you can utilize all the calcium delivered from the product.

VERDE-CAL is the right replacement product when a customer asks for CC. Anyone can find VERDE-CAL within the US and Canada. Many international country's are now using VERDE-CAL as well.

VERDE-CAL will allow you to add "available" calcium to the entire root zone with no incorporation required.

Less labor, less waste, no mower pickup and the calcium is working now, instead of later! One bag of VERDE-CAL will replace four bags of calcite calcium or hi cal lime. What an advantage. Our rates start at 5 lbs per 1000 sq ft and go up to 12 lbs per 1000 sq ft.

When increasing exchangeable calcium, use the higher rate.

One or two applications per year usually are all that is needed.

VERDE-CAL instead of Calcite Calcium!

**Remember  
Spuds McKenzie?**

Facts about Spuds:  
Budweiser mascot.

Spuds was a Female

Born: Oct. 7, 1983

Died: May 31, 1993

Real Name:

Honey Tree "Evil Eye"

**Granular Calcium vs. Foliar Calcium:****HOW TO AMEND SOIL PROPERLY**

We have said it for years! Creating exchange in the soil requires pounds per acre, not ounces per thousand. Amending soil is a very popular practice in spring time, or any time you core aerate or vent or pencil tine turf to add oxygen or nutrients.

Think of it just as you would if you were to apply a fungicide to kill a fungus you may have on the turf.

Do you want 100% of the active ingredient from that chemical? Or do you want just a small amount of active ingredient from the chemical? Of course

you want all of it, and you want it now so the fungus goes away and won't come back! In soil, you want the most release in the most amount from a product because soils have large buffering capacities. Soils will require more product in more pounds to create change of the exchangeable side of the soil test. This comes from granular product, not liquid.

Here are two examples of soil situations and the differences between VERDE-CAL products and a liquid product.

Let's say you need to increase exchangeable calcium from a soil test report. You can use

VERDE-CAL or Liquid Lime. Both say they will increase calcium and raise pH. The soil test report shows a deficit of about 300 lbs of calcium per acre, and a CEC of about 6. Liquid lime products are usually about 25% calcium by volume and the weight of the product is about 14 lbs per gallon. So in one gallon of product you will get about 3.5 lbs of calcium carbonate. To increase the calcium based off of the soil test report, you will need about 86 gallons of liquid lime in the tank. At a cost of about \$20 per gallon (a price I found on the internet) you will spend about \$1,720 per acre to increase the pH.

## Granular Calcium vs. Foliar Calcium: cont.

With VERDE-CAL, you will use two applications of 500 lbs per application per acre. Apply the first, then soil test to determine if a second application is needed.

VERDE-CAL will cost about \$210 per acre. In that one acre application you will deliver at least 150 lbs of available calcium and most likely more due to the advantages of thCa. So if a second application is needed, the total cost per acre would be around \$420 per acre. A far better price vs. the liquid lime. You need to know that liquid lime is quite inexpensive. It is rarely ever used properly and mostly under used based on a soil test.

Remember, all amendments need to be incorporated. Are you incorporating the liquid lime?

Also remember liquid liming products are usually suspension products. This is why they are so heavy. How much calcium carbonate has dissolved in that jug? You really don't know.

VERDE-CAL G can be compared to liquid gypsum products or any liquid product claiming to lower sodium or treat tough soil issues. And the same principles apply here. A liquid product simply cannot deliver the amount of calcium sulfate needed to properly amend the soil. In this case we are talking about sodium, bicarbonates and/or related problems in the soil that require calcium sulfate. The rate of calcium nutrient needs to be at least 85 lbs per acre to relieve these tough soil problems. If you do the math, you will find that the granular products are always the best way to go. VERDE-CAL and VERDE-CAL G products utilize thCa and will out-perform any liquid product when based on good soil testing and follow up tests.

Remember, liquid products cannot deliver the pounds per acre needed to truly condition and amend the exchangeable side of the soil. VERDE-CAL Products utilizing thCa will allow for thorough conditioning with the lowest rates needed.

## Pass the Salt

I was fascinated to learn (or better yet, to reinforce the fact) that life cannot exist without salt! Funny to think about salt this way! Especially when we try to avoid too much salt in our own diets! I was recently watching a show on the Discovery channel about a lake that could not sustain life because it had no salt in it. Then, on the flip side we learn about the Dead Sea and its (somewhat) lacking of life due to too much salt. Finally, I have an excuse for my poor fishing performance! I guess I just cannot find the right amount of salt in the water I fish!!! Blame it on the salt!

In the business of growing turf and ornamentals, I hear the word salt used a lot. Many times it carries multiple meanings that can be related or not to actual salt. Like sodium, tight soils, turf damage, poor color, the body of water in the soil profile that is feeding the turf, poor drainage, dead turf as well as many other "possible" meanings when we speak of salts.

Turf is no different when it relates to salt.

**First things first:** It is important to understand that for the most part, the fertilizers we are using and applying to our turf and ornamentals are salts in some form. We often use the term "ions" when discussing soil and water test nutrients. The term "ion" is a catch all for nutrients that are either cations (positive) or anions (negative). It is also important to know that these ions are not free until they reach the soil system and are released by some means, such as hydrolysis, oxidation, soil temperature or microbial activity. Only when the release of these ions occur, will the process of building up salts begin.

**Testing** for salts can be accomplished in many ways. Many times we see soil tests that omit critical salts tests. Meanwhile, that same golf course is "flushing salts" as a common maintenance practice. If you are flushing salts from your turf areas, you should be doing this based on certain salt tests. A sodium

"A successful person is one who can lay a firm foundation with the bricks that others throw at him or her."

David Brinkley

"In times of rapid change, experience can be your worst enemy."

JP Getty

“Both worry and stress  
reek of arrogance.”  
Francis Chan

## Pass the Salt cont.

test measures sodium salt. In the soil, sodium (na) should not exceed 2% of Base Saturation and should not exceed 18 ppm's on a paste test. In the water test, sodium should not exceed 50 ppm's. When it does, it will be necessary to flush or condition the soil to release this salt that can cause: poor drainage, tightening of the soil, bound up nutrients, lack of fertilizer response, poor color and wilt among other problems.

**Soluble Salts** is another important test for the determination of salt levels in the soil. Without this test you have no way of knowing what your soluble salt levels actually are. Like the sodium (na) test, a soluble salt test typically will cost extra on the soil test report. Our advice has always been to monitor sodium and soluble salts several times per year on at least three or four key greens or other areas. It is worth the money to know where your soil stands.

**Chloride** is another test that can help you understand your salt levels. Chloride usually coincides with sodium. If one

is high so is the other. Chloride levels in water should not exceed 50 ppm's. 50 – 250 ppm relates to a “high” test count.

Lastly, **testing EC** or electrical conductivity will give you an accurate outlook on salt levels in the water or soil solution. Water with more dissolved salt conducts electricity easier and will result in higher EC levels. Levels for electrical conductivity should not exceed .78 mg/l.

The decision to flush should be done with certain criteria. Just like any other area of the golf course or property, all factors should be considered to best determine how and when to treat a known problem:

- Water quality
- Budget
- Recent weather patterns
- Soil type
- Soil/water tests
- EC
- Chlorides
- Sodium
- Soluble salts

Remember, all the fertilizer we apply contributes to salts, but at a very minimal level. Other factors help make the problems of salt worse. If you have been “flushing” your soils, what criteria have you been using? Perhaps you have been spending money where it didn't need to be spent. Many times you may actually be doing more harm than good if you are flushing when there aren't any salt levels built up to require this action. In this case you are leaching many essential nutrients as well. Many of these nutrients, such as calcium or potash for example, could be contributing to the balance of salts and sodium. It is rather an unwelcome result that you may be flushing away the cation balance leading to lowered salts. By doing so, the result “could” be higher salt levels in the future if you are not proactive about replacing those essential nutrients.

**Every soil and every part of the country is susceptible to salt problems.**

“This is your  
time and it feels  
normal to you,  
but really, there  
is no normal.  
There's only  
change and  
resistance to it  
and then more  
change.”

Meryl Streep

## Salt Meters: A Useful Tool for measuring salts in your soil

As you read in the prior article, fertilizer delivers salt to the soil. So if you are growing turf or ornamentals, you need to apply salt in the form of many ions.

To fully understand salt levels in the soil is easiest if you compare it to the greenhouse industry. Why? Because greenhouse growers have been monitoring salt and utilizing salt meters for a long time. To these people it is critical to know the level of salt, or more importantly, nitrate salt in the growing media. They don't want too much salt, and on the flip side, they can't afford to be without salt.

Greenhouses utilize “soil-less” media. They do this

because they only want to hold nutrients, and this can be done in a soil-less way. Soil adds weight, and that is not exactly what they are after.

Soil-less media is used then to “stay out of trouble” when pertaining to salts. It usually will not hold too much or too little. Greenhouses have known this for many years if not decades! For the most part golf courses are just now catching up to this way of thinking because of sand based greens.

Greenhouses have years of research and experience behind them when dealing with measuring salts. They have controlled environment and for the most part can control the application of salt to each individual pot or tray. Golf Course Supts. on the

## Salt Meters cont. 1

other hand have to deal with induced stress such as traffic, weather, poor irrigation systems, compaction, mowing and the list goes on and on. Most of these influences are out of the supts. control, and therefore create all sorts of "salt environments" on the golf course that may need monitoring on a regular basis.

A Salt Meter, or EC Probe (electrical conductivity) is a great tool for measuring salts either in a greenhouse or on the golf course.

Most golf course supts. will "flush" greens from time to time to control salts and to create equal moisture levels across the green. The goal here is to eliminate the usual dry areas for several days while feeling good about salt reduction. The problem with this is that bad salts along with good salts are being flushed away and with no monitoring, damage to the soluble nutrients can occur. Why is this important? Because the soluble nutrients are what feeds the root system of the turf.

So, do you add this to the list of problems resulting from flushing greens when they really don't need flushing? Quite possibly the answer would be yes!

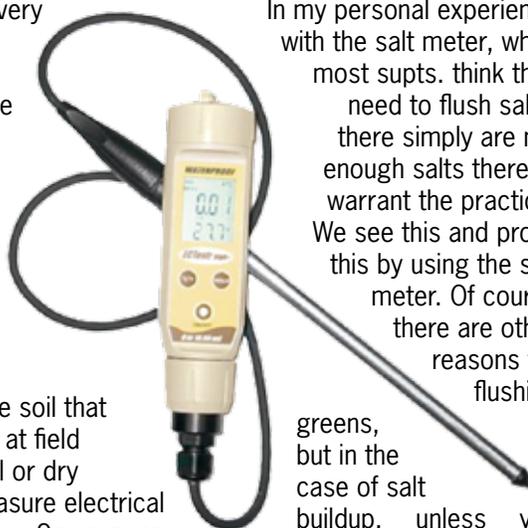
So what do you do to be sure you need to flush salts? Buy a salt meter and begin to monitor salt levels. The Salt Meter can measure your soil and/or water salt levels. See below for water measurement.

A salt meter is a very easy tool to use and is not time consuming. There are some very important tips to know when using a salt meter to ensure it shows proper results.

1. Make sure the soil that you are testing is at field capacity. Dry soil or dry spots will not measure electrical conductivity (EC). So, run an irrigation cycle first.
2. On the end of the salt meter are sensors. These must be clean. No contact with your hands, etc. or you won't get proper measurements. Keep some alcohol wipes handy, or simply use alcohol and a clean paper towel to properly clean the sensors. Wet wipes or similar are not recommended. These can have lotions or oils added to them.
3. Calibrate the salt meter properly before you use it. Use the calibration fluid that comes with the instrument.

Just like in the greenhouse, you never want a zero reading! Only a few times in my travels have I seen this used as a training method. Zero salts results in no food to the roots! That would be disastrous in any industry!

With the salt meter shown, you receive a guide as to what salts should test for adequate levels of salt. Use this guide to help you better manage salts in the soil root zone.



In my personal experience with the salt meter, when most supts. think they need to flush salts, there simply are not enough salts there to warrant the practice. We see this and prove this by using the salt meter. Of course there are other reasons for flushing

greens, but in the case of salt buildup, unless you are planning to add back the beneficial salts, it just doesn't make sense to lose the food feeding the plant. By utilizing the salt meter, now you will know for sure!

### Measuring Electrical Conductivity?

Salt meters can also be used to measure EC in water. Electrical Conductivity is the measurement of salts in water. There are very specific parameters for EC in water. A properly calibrated Salt Meter will allow you to know the state of the salts accurately in your water supply. It is no different than testing soil. Insert the probe into the water and wait for the measurement to read a steady number and you have your measurement.

See the two examples of measured irrigation water on the next page.

The Field Scout Direct Soil EC Probe (Salt Meter) is manufactured by Spectrum Technologies. AQUA-AID is an authorized distributor. If you would like more information regarding the Salt Meter or any other meter Spectrum offers, please let us know. For information about the EC/Salt meter go to [www.specmeters.com/nutrient-management](http://www.specmeters.com/nutrient-management). For information about soil moisture meters go to [www.specmeters.com/soil-and-water](http://www.specmeters.com/soil-and-water).

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

**Salt Meters cont. 2**

**Why a Salt Meter?**

Because you need to know salt levels!

Here are two water samples taken. One of a well and another of the well water treated and sent out on the golf course.

As you can see from the data, VERDE-CAL should be a product of priority. EC levels above 2.0 mS/cm (or dS/cm) are very problematic for turf. This supt. invested the money to treat the irrigation water. Going into the season this spring, he can be confident that he is injecting and conditioning the water properly.

**How would  
he know  
without the  
Salt Meter?**



*Irrigation water after treatment.  
.34 mS/cm*



*Irrigation water before treatment.  
2.46 mS/cm*

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

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

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