

# WATERSOLV™ SOLUTIONS

Break-through Chemistry for Mitigating Water Related Problems

NOVEMBER 2017

# The Problems

Not the water!

The items in water, that water absorbs, that is left behind when the H<sub>2</sub>O is utilized or evaporated.

Mineral Scale, Mussels and the formation of Crystals

Metal Scale and Oxides

Bacteria - Aerobic and Anaerobic

Buildup of Salt, Chloride, Sulfur, Nitrogen and Hardness/Alkalinity

So lets' talk about water!

Pure water is corrosive. It lacks minerals, metals and alkali. It has energy, a natural solvency that is continually seeking equilibrium, balancing the positive charges with negative charges. As pure water moves, it picks up available materials, cations, minerals, metals, to equilibrate.

In many cases, the deposits from this process are food and habitat for microbes.

Most things in our lives seek equilibrium – like steel and rust, oxidation on aluminum, excluding gold.

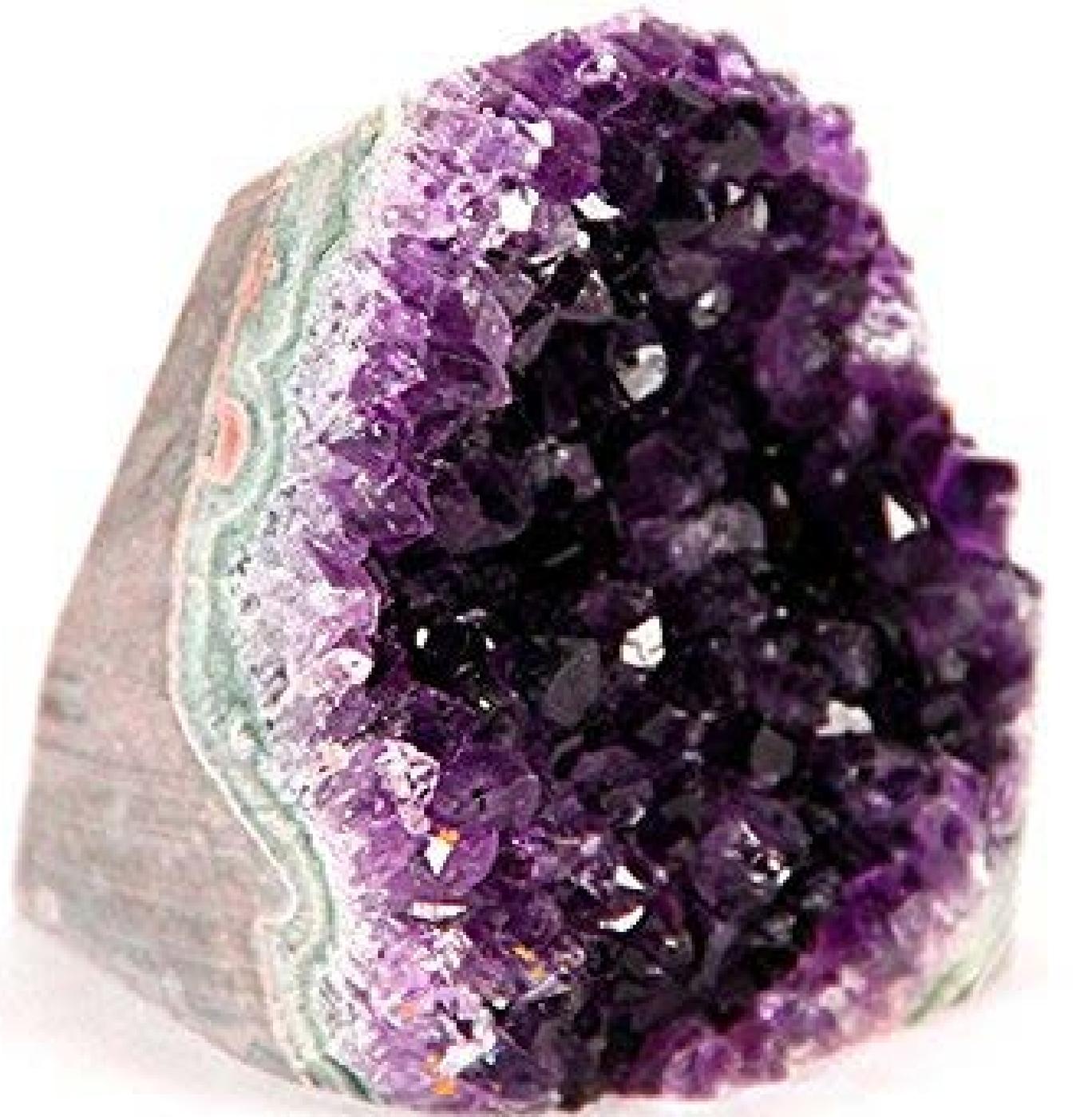


While pure water is a solvent and corrosive, hard water is readily realized from the presence of scale left behind when the water itself evaporates.

This is a process where the corrosive water has dissolved minerals and metals, you can't see it, and the pure H<sub>2</sub>O evaporates.

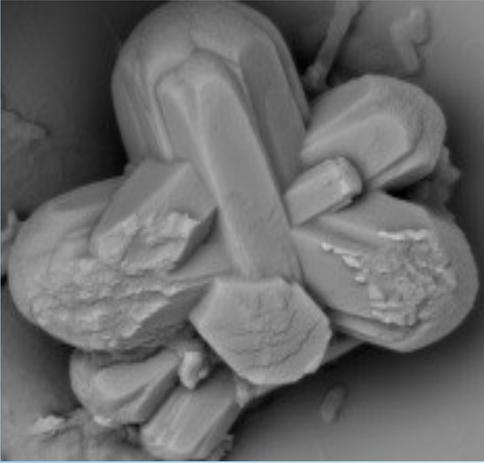
In this image, nearly pure water with nano, micro crystals has evaporated and left behind the matrix of calcium to complex with carbon dioxide to form crystals. Readily dissolved back to solution with acid, releasing the carbonate.



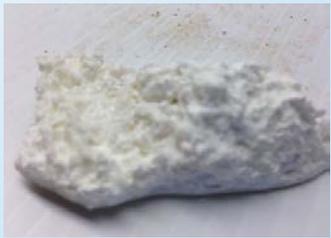


Mother nature plays a significant role, where concentration of the minerals and metals “nucleate and crystalize”. Not any different than growing rock crystals in grade school.

The amethyst crystal is calcite. It is purple from the presence of iron.



Crystals are actually a form of calcium. Like sea shells, caliche, calcite, amethyst, calcium carbonate, even iron oxide and zebra mussels, they are all calcium based bound by carbonate, and can be dissolved back into the water by releasing the carbonate.





## **Evaporative Salts**

Water evaporates over and over, crystals continue to form.

Scale and biological conditions become detrimental and overbearing.



Moreover, the products we use to treat the conditions can form crystals that are even more difficult to dissolve. For example, sulfuric acid evaporate salts for calcium sulfate which is very dense and very difficult to dissolve over an over again. Hence why the use of sulfuric acid diminishes in results and why gypsum is then FORCE FEED / prescribed.

So before we get started  
with the solution to these problems . . .

**Let's start with  
setting some best  
practices for you  
from our  
perspective.**

1. Environmental Fate – If you put something on, what is its complete environmental fate.
2. If you are overloaded on sulfur, don't add sulfur based products.
3. Likewise for sodium, unless you have something that mitigates sodium and chloride, avoid adding it.
4. pH – If you are fighting to suppress pH or having to use more acid or adding gypsum, you need to change what you are doing. The amount of bound up minerals on your soil is not only out of control but it is bound up nutrient that has monetary value that we can make available. This is also stifling product yield and quality.
5. What are we doing about bacteria – mainly the anaerobic and sulfate reducing, bacteria conditions?

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The main text is centered in the upper half of the image.

# ABOUT OUR TECHNOLOGY

INSIGHT TO WATER PROBLEMS

PRESCRIBE ACCURATE SOLUTIONS TO CHEMISTRY, ENERGY PRODUCTS, PROCESSES AND PROCEDURES

LONG LASTING RESULTS

PROPRIETARY CHEMISTRY, INTELLECTUAL KNOWLEDGE & EXPERTISE

# OUR CREDENTIALS

OVER 500 WATER WELLS SERVED IN 4 YEARS

350,000 ACRES OF AGRICULTURE TREATED OVER 3 YEARS

80% OF THE ARIZONA HORTICULTURE MARKET IN 4 YEARS

JUST BROKE GROUND IN TURF MARKET AFTER 1 YEAR BETA TESTING

# CHALLENGES IN WATER

LACK OF SOLUBILITY FROM  
CARBONATE & OXIDE BOUND MINERALS

COMPROMISED NUTRIENT A  
AVAILABILITY AND UPTAKE

TOXICITY FROM SODIUM AND CHLORIDE



# It's just Water?

Water may look good but the water goes away, what is left behind is ever increasing trouble.



# What about bio?

You can't overlook bacteria. The water may be clear but it can also be loaded with bacteria that multiplies exponentially.



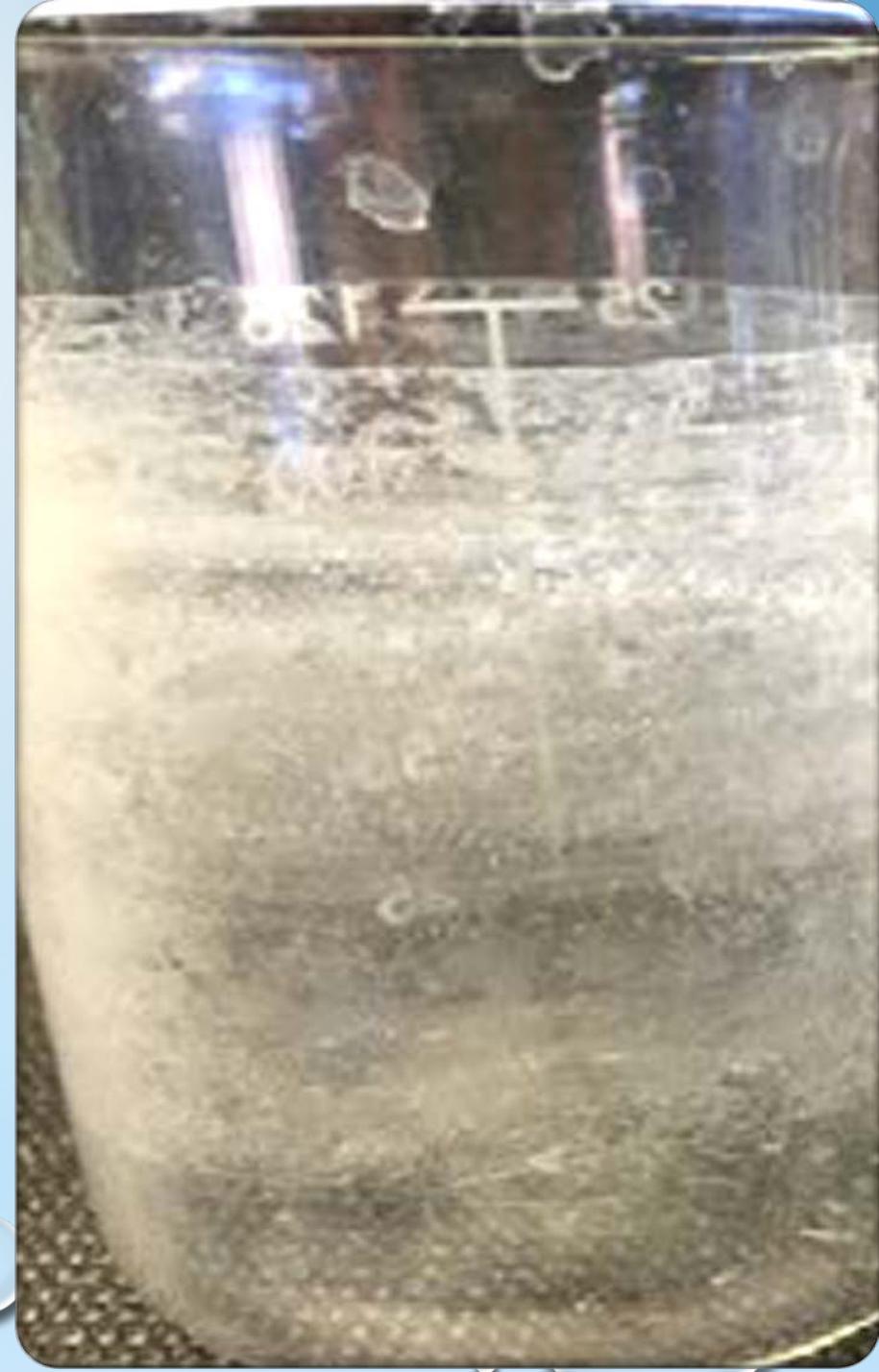
# MINERALS CONCENTRATE, NUCLEATE & CRYSTALIZE

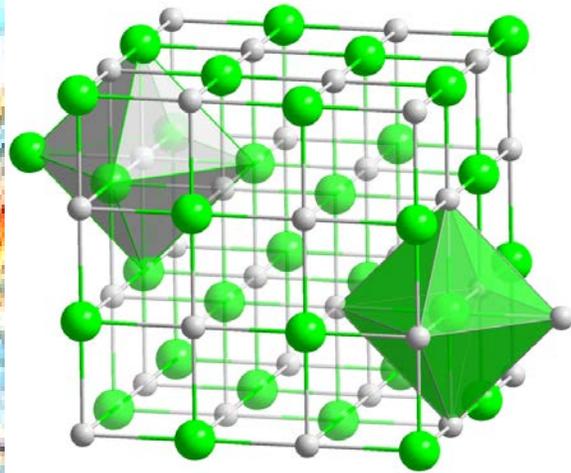
*IT TAKES 5 TIMES THE CHEMISTRY*

*TO DISSOLVE A CRYSTAL THAN TO PREVENT IT*

*IF THIS IS JUST THREE INCHES OF WATER  
EVAPORATED TO DRYNESS, WHAT IF IT WERE 6 ACRE  
FT.? MULTIPLY THIS AMOUNT OF SCALE 24 TIMES.*

*IT'S NOT SALT, IT'S SCALE, MINERALS, PRIMARILY  
CALCIUM & MAGNESIUM. SALT WOULD BE SODIUM  
& CHLORIDE.*



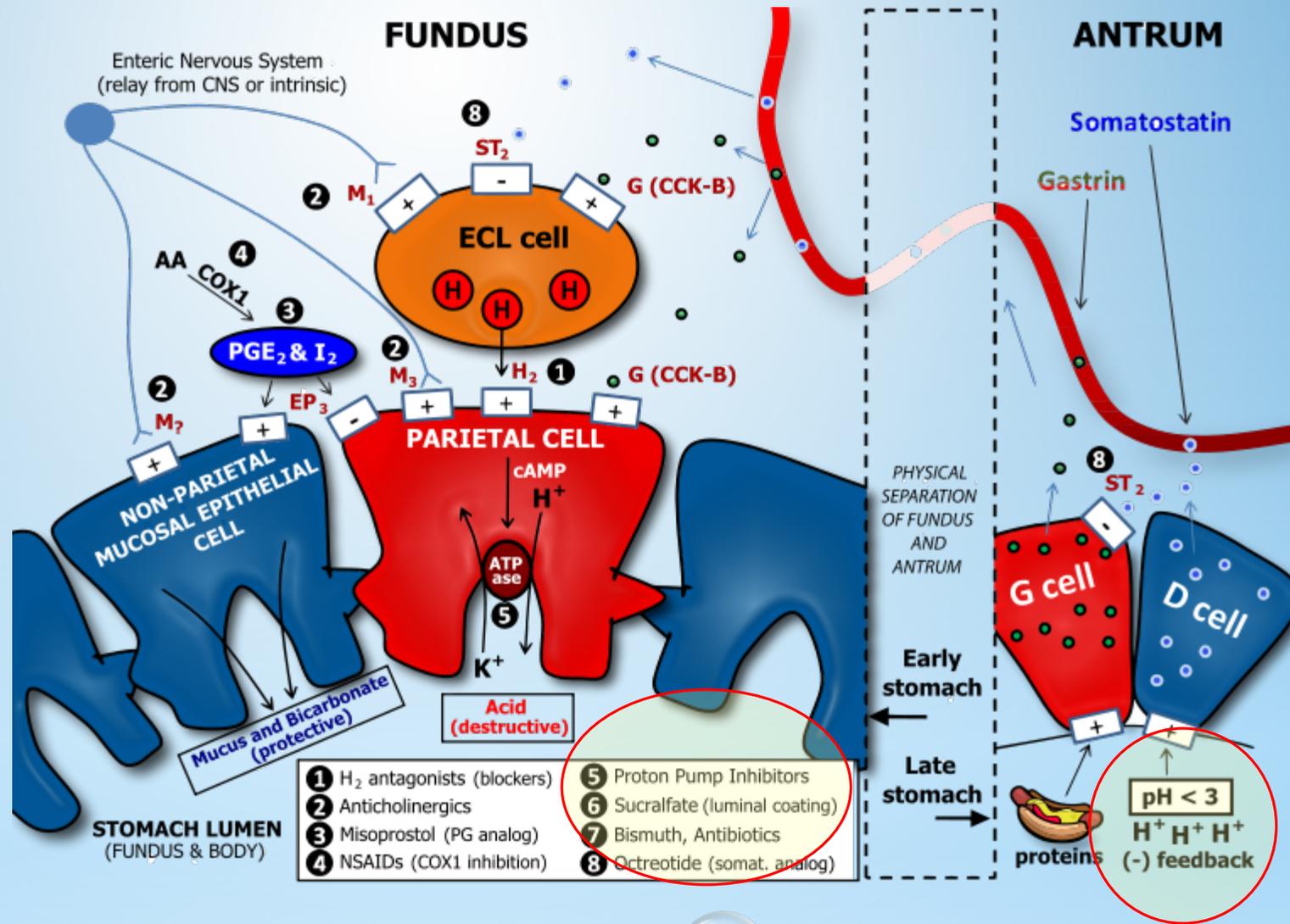


**SODIUM AND CHLORIDE  
BONDS TO EVERYTHING  
GETS TRAPPED IN CARBONATE SCALE  
EVEN RAIN BECOMES TOXIFYING**

The structure of sodium chloride, revealing the tendency of chloride ions (green spheres) to link to several cations.

How does our body deal with sodium and hardness?

Chemistry & Enzymes.





Chemistry that Works Here  
Should also Work There



# WHAT WE'VE BEEN DOING TO COMBAT THE PROBLEMS

PH CONTROL / ALKALINITY REDUCTION

FORCED NUTRITION

WETTING AGENTS

DISPERSANTS

FLUSHING SALTS (1)

*(1) MAJOR WATER USE AND SUPPLEMENTAL LOADING*

*HORRIBLE CARBON FOOTPRINT*



More Water

More Alkalinity Reduction

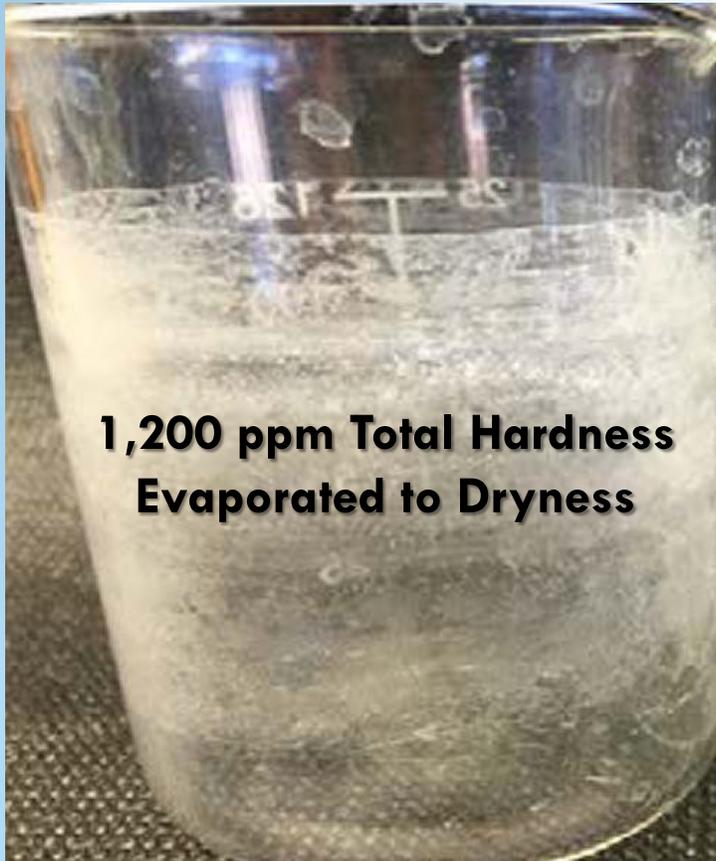
Average Yield

Average Product Grade

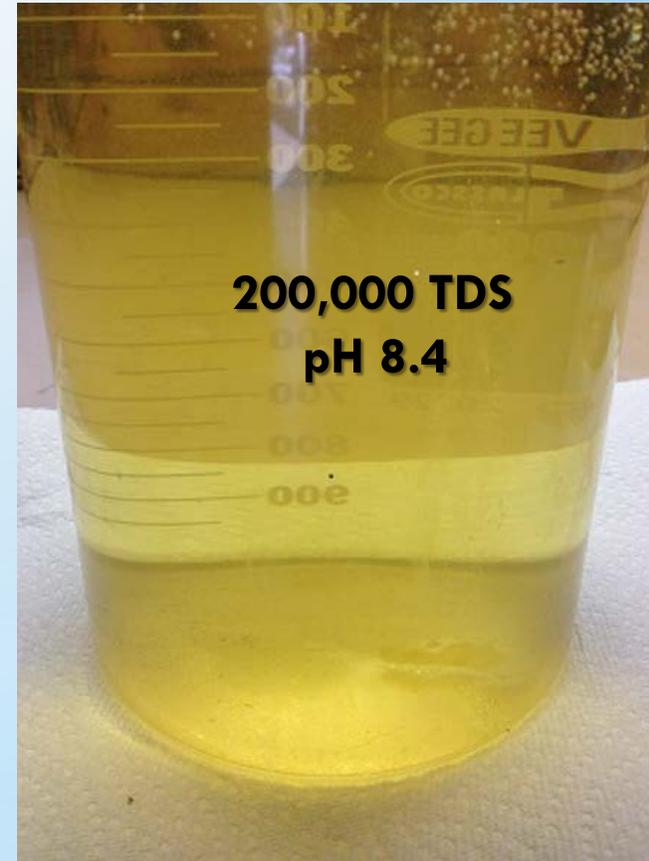
Lower Revenues



**NUCLEATION, CRYSTALLIZATION  
PROBLEM**



**STABLE DISSOLVED SALTS  
AVAILABLE NUTRIENT**



Remember  
me? This water  
look familiar?



# pH - It's a tough subject to explain, but here we go . . .

pH is a transient indication of waters condition to make things soluble in water and available to enhance plant nutrient uptake and hopefully growth.

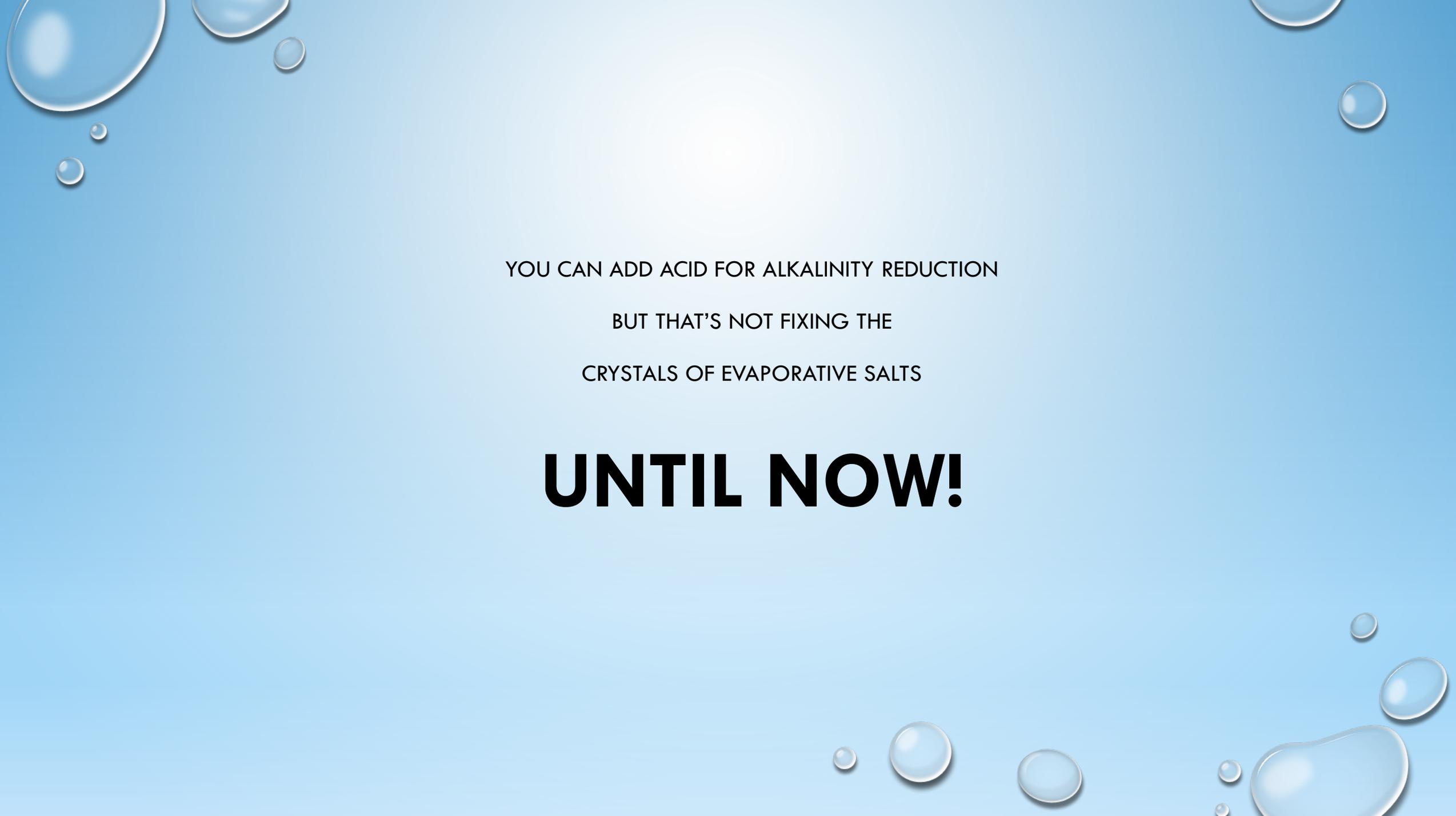
Riddle us this – why, year over year, is sulfuric acid demand increased and eventually gypsum prescribed? Why didn't continual pH control solve this problem? The reason is that the pH was used to treat the alkalinity in the water and had no impact on the evaporative salts that formed crystals.

Consider the pH of beer – as in Budweiser. Can Budweiser, pH of 3, adjust your pH enough to provide efficacy? What about citric acid, or glycolic or phosphoric? Why sulfuric? Does it add surplus sulfur and cause other problems. And what about ammonia, a very basic pH, as in 11 units, will the increase in pH from ammonia cause scale? In both cases, the answer is NO! Calcium chloride will help, right? NO!

The Solution: Langelier Saturation Index – pH, TDS, Ca, Temp, Alkalinity. “All these factors” in an equation, determine the tendency of the water to dissolve or to precipitate minerals and metals, not just pH.

*Why is ammonia alkali and doesn't form scale?*

*Why is the pH of RO water 5- 6?*



YOU CAN ADD ACID FOR ALKALINITY REDUCTION

BUT THAT'S NOT FIXING THE

CRYSTALS OF EVAPORATIVE SALTS

**UNTIL NOW!**

# Proof

pH DOES NOT INDICATE SOLUBILITY

## Water Analysis of a Saturated Descaling Solution

Will not dissolve any more scale yet pH is below 3.0  
Why? – Saturation, like sugar into tea.

Parameter	HCl 10%	HCl 9% 1% Additive	Variance
pH	<b>2.7</b>	<b>1.5</b>	N/A
Calcium	7,950	9,140	13%
Magnesium	85	90	6%
Calcium Hardness	19,800	22,800	13%
Magnesium Hardness	351	371	5%
Total Hardness	20,200	23,200	13%
TDS	33,700	34,600	3%

Will more sugar dissolve in iced or hot tea? What about scale in water?

### Case & Point

How much sugar  
can you dissolve  
in ice tea?

How much in hot tea?

# WHAT IS THE SOLUBILITY OF

CALCIUM SULFATE

MONO-AMMONIUM PHOSPHATE

CALCIUM PHOSPHATE

CALCIUM SILICATE

WHAT DOES SODIUM AND CHLORIDE ATTACH TO . . .

GOOGLE CAN SHOW YOU A TABLE OF HUNDREDS OF  
SOLUBILITY THRESHOLDS AT VARIOUS TEMPERATURES

# THE PRODUCTS

Water**SOLV**<sup>™</sup> Curative

Water**SOLV**<sup>™</sup> BC

## Accreditations:



Standards Council of Canada  
Conseil canadien des normes



# WaterSOLV™ Curative

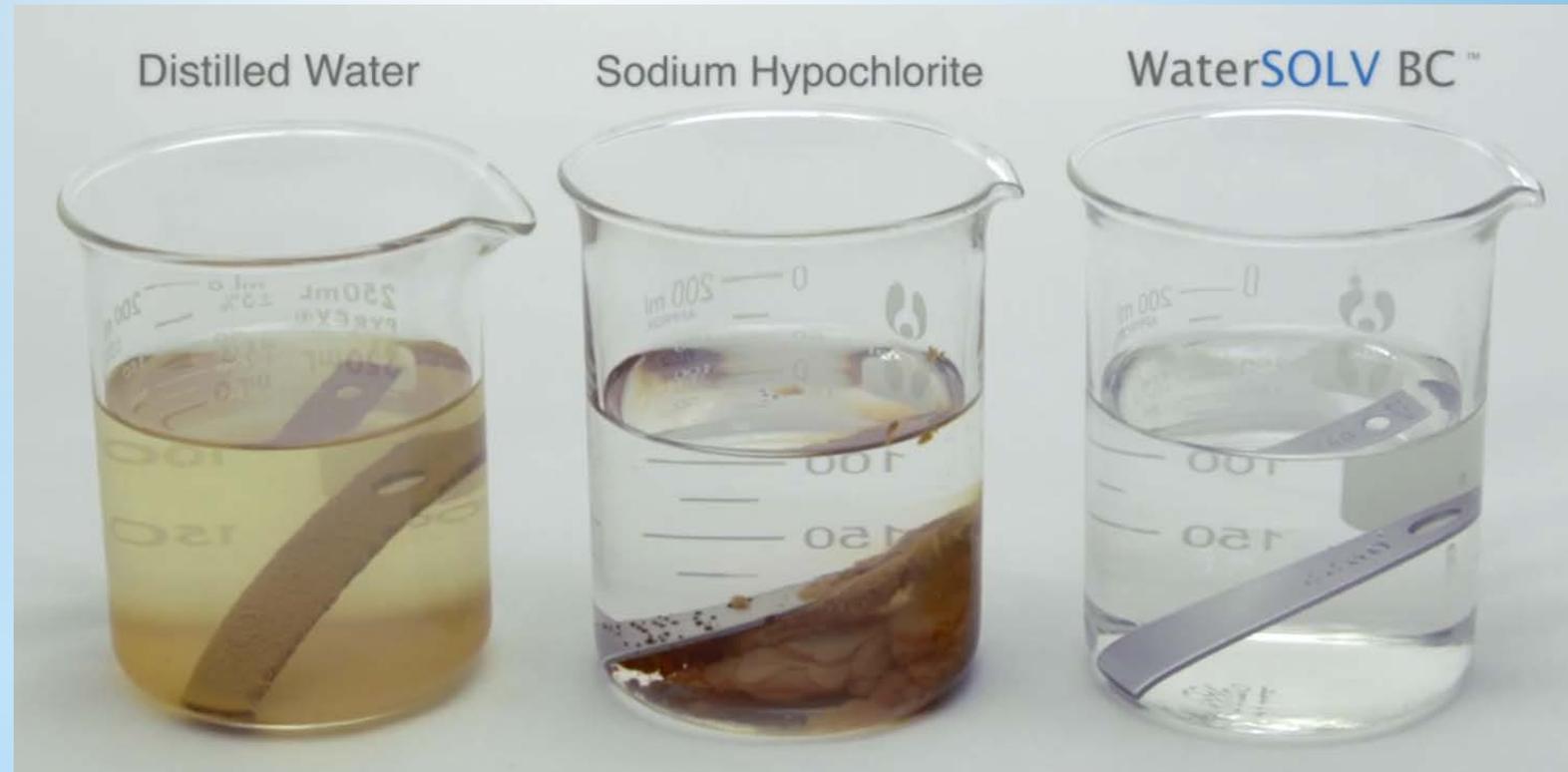
TREATMENT RATE:	$\text{Total Hardness} + \text{Total Alkalinity} / 200 = \text{ppm of treatment}$
CONSTITUENTS:	HCl + Glycolic Acid + Secret Sauces
RESULTS:	Soluble Mineral Salts + Protonated Sodium and Chloride
USAGE:	1 gallon per acre ft. of water (3 ppm)
COST:	\$20.00 gl. bulk
ROI:	15% increase in yield, grade 1 product, 50% reduction in nutrient expenses, year 1, lower harvest costs, 10% increase in water efficiency. Mitigation of mussels.
APPLICATION:	Continual water treatment
NUTRIENT VALUE:	Priceless – 0-0-0

# WaterSOLV™ BC

TREATMENT RATE:	$((\text{Sulfate} / 100) + (\text{Ttl. Bacteria Exponent})) \times .25 = \text{ppm treatment}$
CONSTITUENTS:	Peroxide + Secret Sauces
RESULTS:	Organically inhibited peroxide, peracetic acid on the fly
USAGE:	Periodically about 1 liter per acre ft. of water (0.75 ppm)
COST:	\$45.00 gl. bulk
ROI:	Gradual recovery of an aerobic grow profile. Increased plant health and vitality. Lower demand for pest and microbial treatments.
APPLICATION:	Periodic water treatment
NUTRIENT VALUE:	Priceless – 0-0-0

# WaterSOLV™ BC

- Mild Steel Metal Strip
- About 14 hours Exposure
- Mild Steel is Destroyed by Chlorinated Water
- Chlorinated steel by-products are substance for biological support
- Chlorine is “the” disinfectant of choice, but not a bio-cleaner
- WaterSOLV™ BC is a top notch bio-cleaner and substantially more effective cleaner but NOT a disinfectant



# OUR MARKET COMMONALITIES

- Water Wells
- Horticulture
- Agriculture
- Turf
- Car Wash Recycled Water
- Water Reuse
- Reclaimed Water

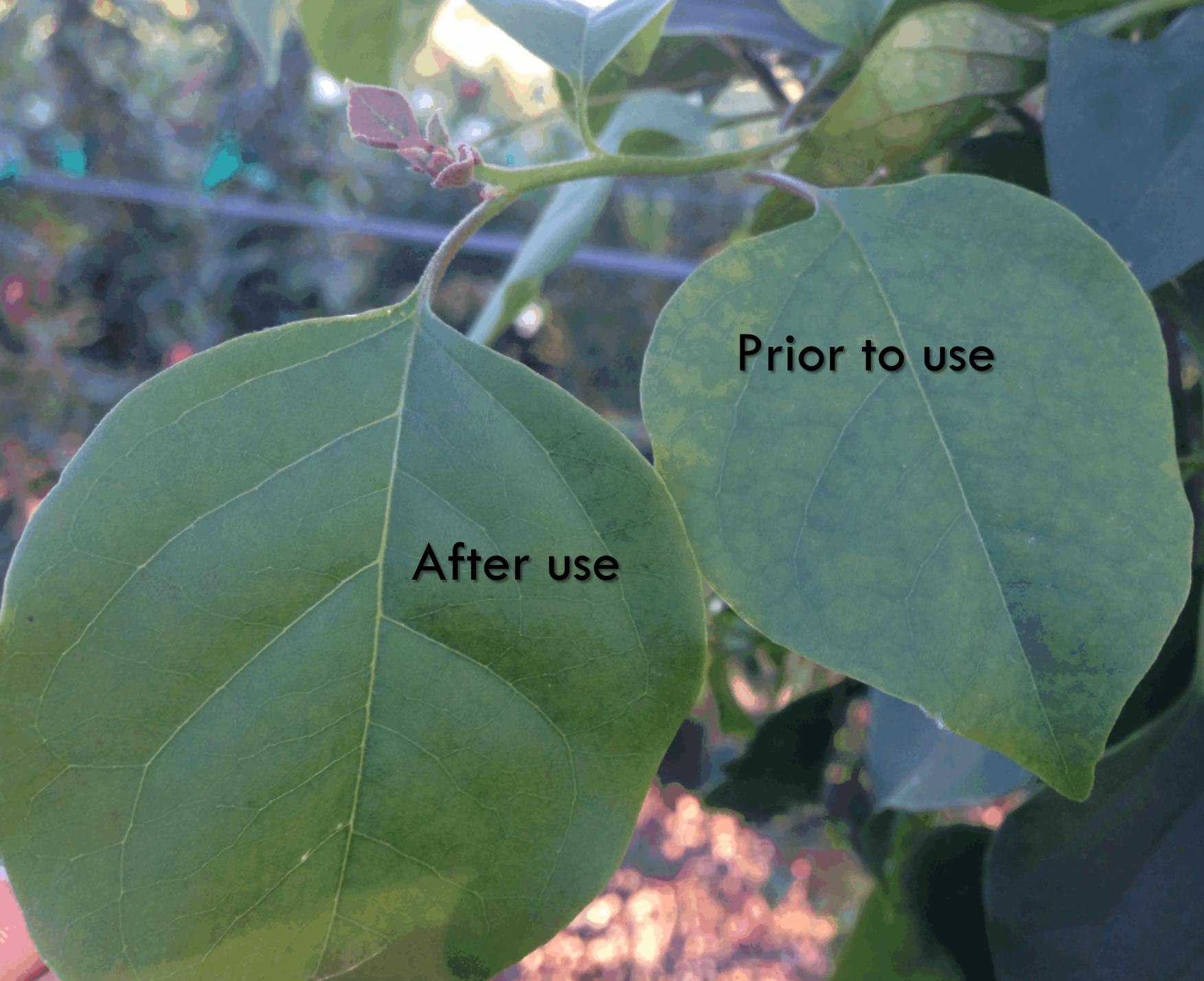
Minerals – as in carbonate scale

Metals – as in corrosion products (iron oxide)

Microbes – as in anaerobic bacteria, mold and fungi

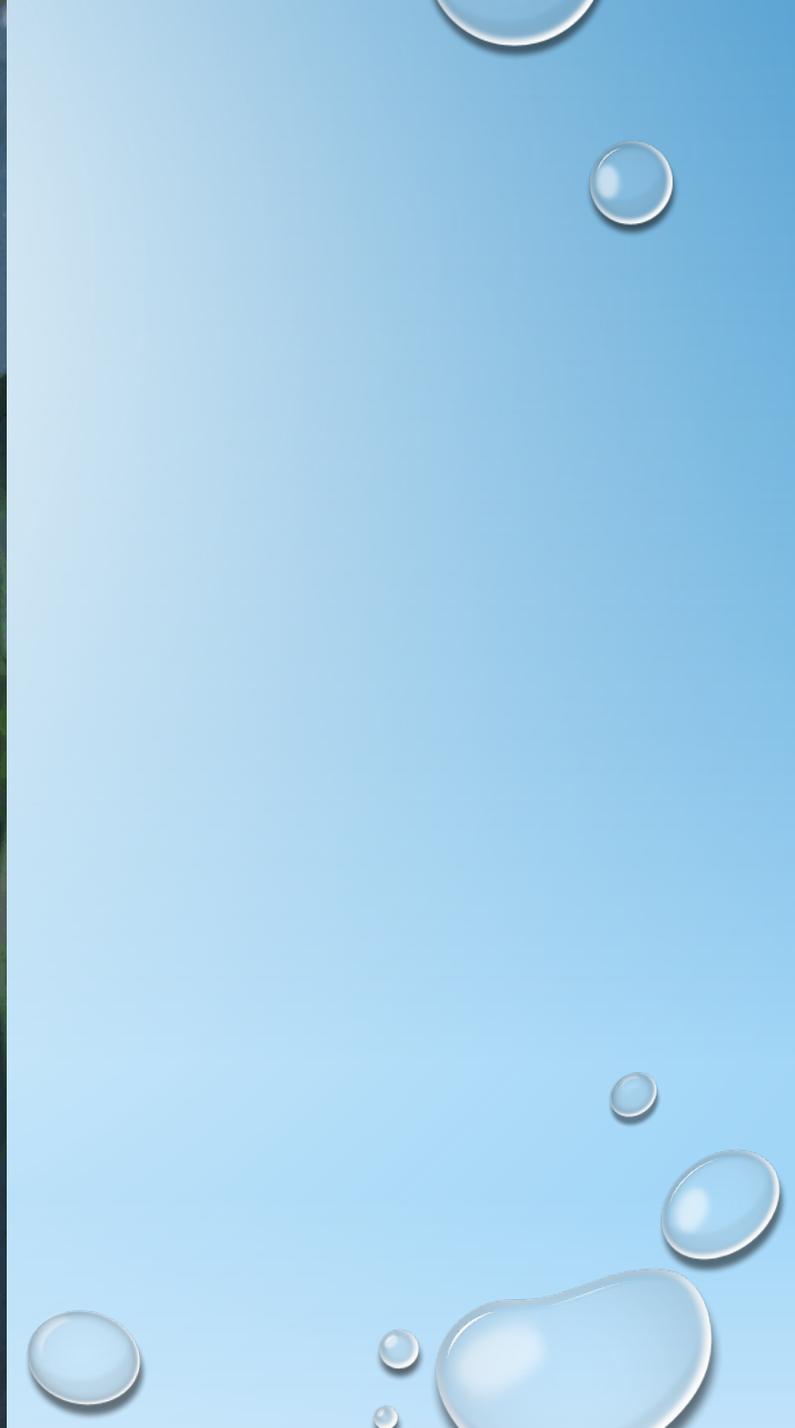
Mussels – as in zebra, quagga, Asian and the like

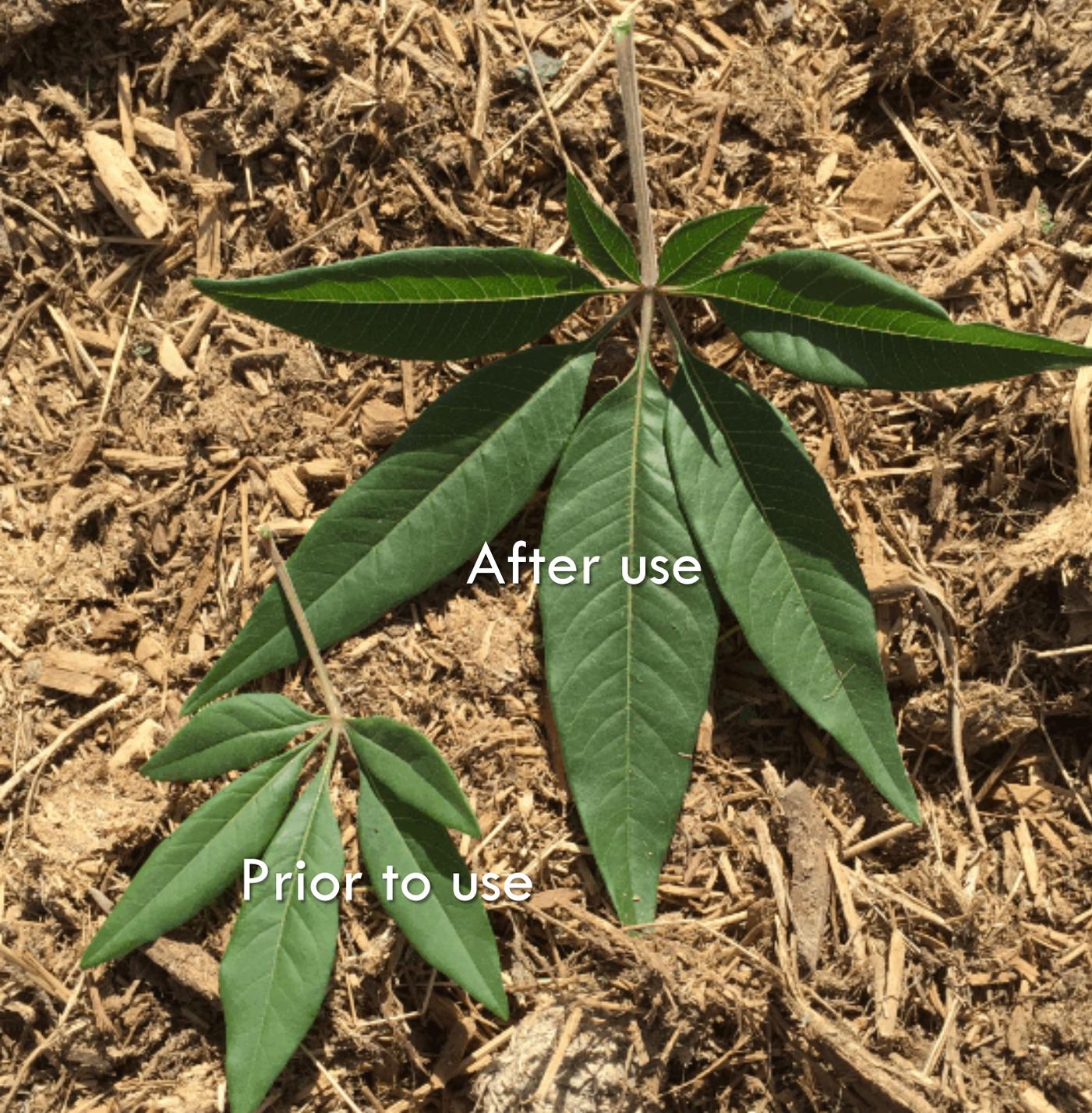
Mud – as in water wells and drilling mud



After use

Prior to use





After use

Prior to use



Prior to use

After use

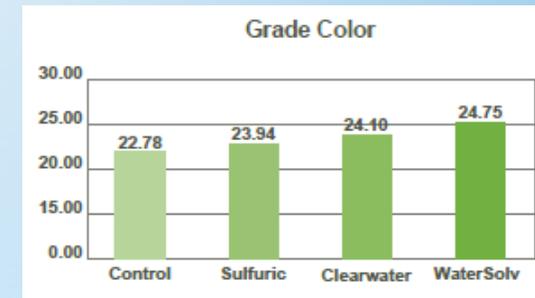
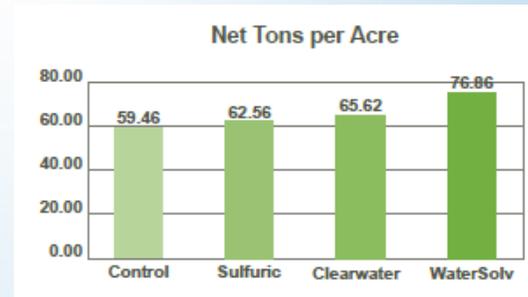




- From 1,500 to 2,200 boxes per acre
- From Grade 3 to Grade 1 grapes
- Increased revenue \$10,000/acre
- Chemical cost \$60/acre

Southern, Central Valley  
California  
115 deg. F  
Still pushing

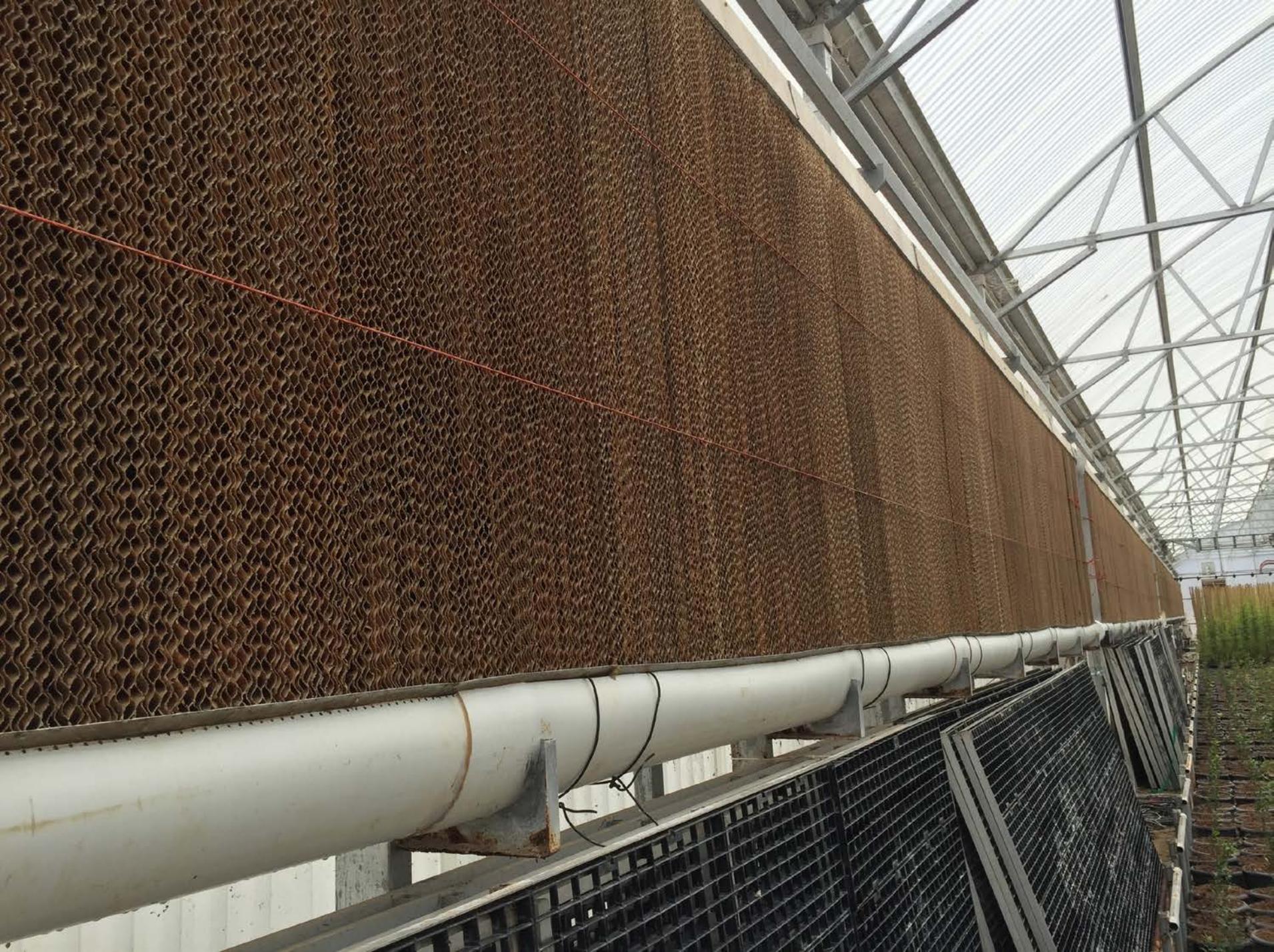
# TOMATO TRIAL



Densities	Acres	Net Tons per Acre	Net Paid Tons per Acre	Net Weight Tons	Paid Weight Tons	Weight Delta	Grade Worm %	Grade Mold %	Grade Green %	Grade MOT %	Grade LU %	Grade Color	Grade Brix	Grade pH
Control	23.93	59.46	55.98	1,422.95	1,339.65	5.85%	0.01%	0.60%	0.69%	3.13%	0.48%	22.78	4.85	4.41
Sulfuric + BioFlora	20.40	62.56	58.62	1,276.21	1,195.81	6.30%	0.00%	0.28%	1.18%	3.36%	0.33%	23.94	5.07	4.40
ClearWater + ProMaxx	17.67	65.62	59.43	1,159.55	1,050.11	9.44%	0.00%	0.38%	1.36%	5.75%	0.45%	24.10	4.99	4.39
WaterSolv+Bactor Boost	19.57	76.86	73.49	1,504.06	1438.20	8.67%	0.00%	0.24%	0.47%	3.39%	0.28%	24.75	5.11	4.39



2 year old grape vine  
Size of 4 year old vines  
Produced grade 1 crop  
in second year



9 years old  
CELdek<sup>®</sup> Media





If an adult mussel purifies 1 ltr. of water a day, what happens to downstream water quality when the mussels are removed from the stream?

Where did the mussel get all that calcium to build it's shell?



## SEEING IS BELIEVING

“Never before seen results”

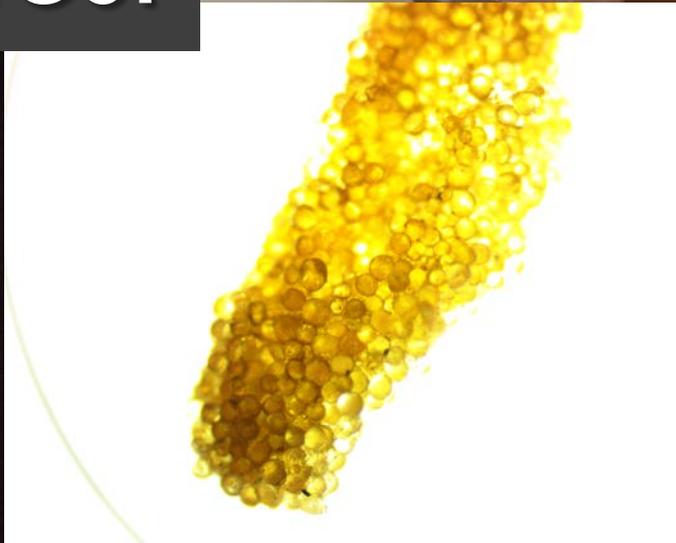
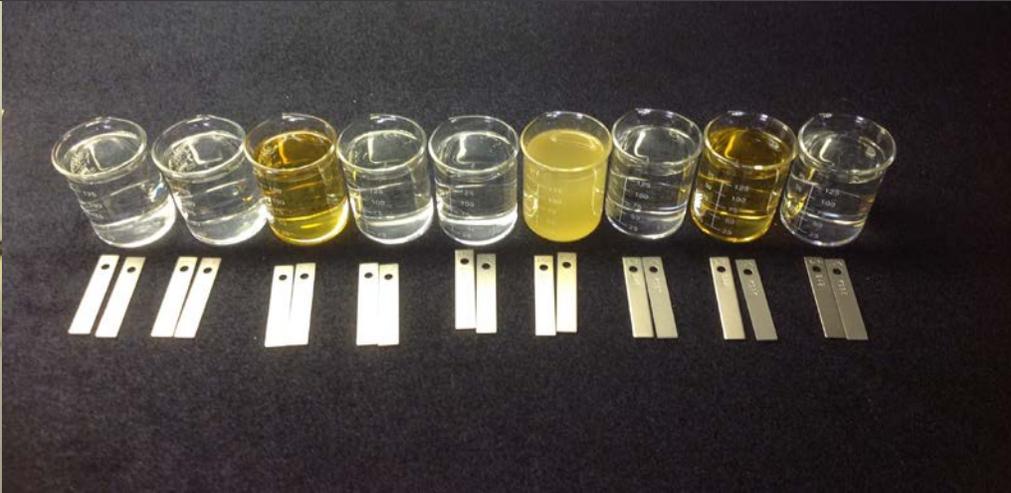
Applied at 3 ppm for mussel mitigation,  
moved to 6 ppm for soil mitigation.

She called him “Your Holiness” . . .

Jr. PGA Director never saw a course where  
they only had to mark the drains and  
sprinklers.



We Don't Guess, We Test



The logo for WaterSOLV™ features the word "Water" in a black, sans-serif font, followed by "SOLV" in a larger, bold, blue, sans-serif font. A small "TM" trademark symbol is positioned to the upper right of the "V".

# WaterSOLV™

An Assurance to Predictable Results  
and Enhanced Revenues  
Through Water Treatment  
for Minerals, Metals, Microbes, Mussels & Mud



See more . . .

Online field videos  
and laboratory testing  
at [www.hctllc.com](http://www.hctllc.com)

	Bio Scale		Selections	
	Bio	Scale	Bio	Scale
Age, years	8	1	0	5
	14	2	1	1
	16	3	2	2
	24	4	3	3
Casing Material	PVC	1	0	0
	Stainless	2	0	0
	Steel	4	3	3
	Spot	2	1	1
Perforations	Lower	2	2	2
	Wire Wrap	4	3	3
	Liner	4	1	1
Liner	Liner	4	1	1
	Jetted	4	1	1
LSI	Lt. Corr	3	0	0
	Corr.	2	0	0
	Lt. Scale	2	1	1
	Scale	3	2	2
Groundwater Sulfate	Lt. 100	1	0	0
	Lt. 200	2	0	0
	Over 200	3	0	0
Totals				

Remediate, ppm	Minimum
WaterSOLV™ BC	Moderate
	Heavy
	Extreme
Minimum after using BC	
Descale, % vol	Light
Well-Klean®	Moderate
Pre-blend	Heavy
	Heavy + Oxide
	Extreme + Oxide

