The Pro's and Con's to Sulfurous Acids

HCT, LLC 5/2020

	Product Trait	(A) Sulfuric Acid	(B) WaterSOLV™ Curative	Notes & Value
1.	Inexpensive pH reduction (1)	YES	YES	Equivalent use cost
2.	Excessive Sulfur Loading	YES	Contains None	B contains no sulfur
3.	Excessive Nitrogen Loading (2)	YES	Contains None	B contains no urea or N
4.	Added Nutritional Value	NO	YES	B converts nutrients to high grade nutrition – even shells and soil loaded minerals and metals
5.	Sustainability	NO	YES	B 100% sustainable chemistry and byproducts
6.	Increased demand over time	YES	NO	B No more competing with the bicarbonate, permanent ion exchanges
7.	With bacteria sustains bio-films & root rot	YES	NO	Sulfur is food source for bacteria (Black Layer) N blocks oxygen flow when acidified
8.	Water Penetration continues to get worse	YES	NO	A - Evaporative salts of strong acids do not dissolve - UC Davis, Solubility-of-Salts/Solubility Equilibria
9.	Can Convert snails and shells to high-grade nutrition	NO	YES	B – at just 3 ppm
10.	Resolubilizes precipitated calcium phosphate	NO	YES	B – and converts it to available nutrition
11.	Can be used to remediate soil and infiltration	NO	YES	B – harvest bound minerals and nutrients
12.	Disassociates chloride from sodium, calcium and iron (3)	NO	YES	B – ion exchanges
13.	Renders Sodium non-toxic	NO	YES	B – ion exchanges
14.	With Ca and K at elevated levels, still requires gypsum	YES	NO	B – not necessary to add supplemental Ca or K
15.	Required Gypsum creates insoluble oxalates	YES	Contains None	B – No gypsum necessary
16.	Required gypsum compete for water (desiccant)	YES	Contains None	B – No gypsum necessary
17.	Extreme Safety Hazard	YES	NO	B – Not damaging to the skin. Tough on eyes and breath. Like swimming pool acid but safer.
18.	Use rates require significant volumes of product	YES	NO	B – 1/10th of acid used.

19.	Acid settles in water and piping and is corrosive	YES	NO	B – become part of the water and operates in basic pH values, similar to pool acid but even less corrosive and safer.
20.	The bicarbonate exchange is permanent	NO	YES	B – This is how B is able to be 1/10th of sulfurous acids
21.	Upon evaporation to dryness, the minerals form insoluble crystals	YES	NO	A - Evaporative salts of strong acids do not dissolve - UC Davis, Solubility-of-Salts/Solubility Equilibria
22.	Evaporative salts rehydrate to high grade nutrition	NO	YES	B – Always hydratable nutrition
23.	Water Hardness and Metals remain ionic	NO	YES	B – Always hydratable nutrition
24.	Added amino acids, glycolates and +++	NO	YES	B – Beneficial nutritional additives
25.	Water demand reduction of 10% and more	NO	YES	B - Infiltration
26.	Reduces water and pumping costs	NO	YES	B – Less water demand
27.	No Heat Stress – Continuous Hydration with Nutrition	NO	YES	B – Continuous available hydration and nutrition
28.	Increased growth rate and crop yields	NO	YES	B – No stresses, available hydration and nutrients
29.	Crop Uniformity	NO	YES	B – Vegetation getting what it needs
30.	Catalyzes the use of peroxide to form a peracetic acid	NO	YES	B
31.	Lower cost of logistics (safety, transportation, volume)	NO	YES	B – 1/10th the volume
32.	Capital Equipment Cost & Replacement	Extensive	Minimal	B – usually able to use the same equipment
33.	Plug and Play Packaging	NO	YES	B – No depreciating tanks.
34.	Availability – limited (like now with Covid)	??	YES	B – No shortages. Not dependent on the petroleum industry
35.	Deters anoxic conditions from bacteria	NO	YES	B – Not adding nutrients for anaerobic bacteria
36.	Proven across the USA and various market segments – turf, ag, nurseries, landscape, …	NO	YES	B – millions of acres.
37.	Impacts all vegetation watered	NO	YES	B – across the USA
38.	Creates vegetation vitality even with hard, salty and reclaim waters.	NO	YES	B – across the USA

(1) Use Cost: Cost of product times rate of application.

Example 1 - $3.00 gl. at 90 ppm = ($3 x 90 = $270)
Example 2 - $30.00 gl. at 4 ppm = ($30 x 4 = $120)

Example 2 is 66% less expensive to use yet 10 times the cost per gallon.

(2) Blocks oxygen flow. Must reduce N with WaterSOLV™ BC before acidifying soils to remediate cementation / harvest bound minerals and nutrients.

(3) Initially must double treat and over water on several occasions to mitigate existing sodium accumulations.